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NATURAL HISTORY

OF

QUADRUPEDS.

ILLUSTRATED WITH

NUMEROUS ENGRAVINGS.

NEW-YORK:

HARPER & BROTHERS, 82 CLIFF-STREET

1840.

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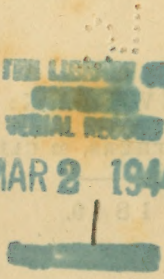

PUBLISHERS' ADVERTISEMENT.

THERE are few subjects more interesting than the natural history of quadrupeds. Although separated immeasurably from man, as possessing none of the higher attributes of his nature, and as being designed for a totally distinct and infinitely inferior end, they claim, by the perfection of their corporeal organization, to be classed physically in the next grade below him in the scale of animated nature. Among the most consummate and admirable, therefore, of the terrestrial works of the great Creator, and signally manifesting his wonder-working skill, his unspeakable wisdom, power, and goodness, the study of their organization, and character, and habits, cannot be otherwise than highly entertaining and instructive.

The volume here offered to the public will be found to contain a very full account of many of the most interesting of this class of animals, and is richly embellished with cuts exhibiting their form, manners, &c. The work was first published

in the series of the British Society for the Diffusion of Useful Knowledge, and has been carefully revised, and such portions as were chiefly of local interest have been excluded from the present edition.

H. & B.

New-York, October, 1839.

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QUADRUPEDS.

CHAPTER I.

INTRODUCTION.

NATURAL History has been called the science of observation, as distinguished from other sciences which are founded upon calculation or experiment. From this peculiarity, Natural History is, in many respects, the most easily pursued, and the most agreeable in the pursuit, of all the various branches of human inquiry and study. Its limits as a science are almost boundless; for scientific naturalists are daily adding some new or uncommon specimen to our previous collections of animal, vegetable, or mineral nature. At the same time, every detached object of this science, every quadruped, bird, reptile, fish, worm, or insect; every flower, every piece of metal, crystal, or stone, not only excites greater interest when we have acquired, by careful investigation, a knowledge of its properties, but leads the mind forward to new subjects of curiosity. As an *observer of nature*, every man has it in his power to become a naturalist, in a greater or less degree.

Although every one possesses this power, and has thus abundant opportunities of adding largely to his stock of intellectual enjoyment, there are many who pass through life without the slightest regard to those wonders and beauties of the creation by which

they are surrounded. It is the distinction between the savage and the civilized man, that the one has no respect for the qualities of the living beings or inanimate substances among which he is placed, except as they minister to his physical wants; while the other, without neglecting their subservience to his necessities or comforts, views them likewise with reference to all the conditions of their existtence—considering each variety of the whole world of Nature, whether separately or in groups, whether individually perfect or in parts, as affording the most striking illustrations of the extraordinary adaptation of every existing thing to the purposes for which it was created—the most complete proofs of the wisdom and goodness of the Creator. This distinction between the savage and the civilized man has been produced by habit and education. The savage has constantly to seek the precarious means of maintaining life; for he has not learned those useful arts, and those combinations of individual power, by which a supply of food and raiment is systematically provided for the necessities of society. Men advanced in civilization have the full advantages, first, of the division of labour, by which those whom habit has rendered expert are enabled to supply our necessary wants, for instance, of clothing; and, secondly, of mechanical power, by which operations are rendered short and easy, which would otherwise be tedious and laborious. It is from these circumstances that we have all some leisure to acquire knowledge; while the general stock of information which is possessed by society is insensibly diffused among all its members, and reaches even the minds of the most uncultivated.

It is thus the positive duty of all to acquire knowledge, by observation, by reflection, by reading, by listening to the informed; for the greater the portion of the general stock of knowledge which each individual is enabled to acquire, the more is his own well-being promoted, and the more is society benefited. Knowledge is not limited in its quantity, and is not, in our times, of necessity confined to particular classes. Every one, however humble, may appropriate to himself some of its most valuable treasures; for its stores are always large enough for the supply of every demand, and the more they are drawn upon, the more inexhaustible appears to be the fund from which they are derived.

The first step in the successful communication of any branch of knowledge is to awaken the attention of the mind to the object or assemblage of objects to which that branch of knowledge applies. Without a habit of attention to the things around them, men walk about in the world with their eyes half shut; for they are insensible to all but the commonest external appearances, and have no perception of the minuter peculiarities which distinguish one class of objects from another, of the beauties of their structure, or of the harmonies of their arrangement. Take an example: engaged as we are in the ordinary pursuits of life, in our business and in our pleasures, it is but rarely that we bestow attention upon those most stupendous works of a ruling Providence: the sun, the planets, the myriads, of stars, of which it might be thought that the bare contemplation would awaken in us a feeling of unbounded wonder and admiration. It is only when

some singular appearance of those vast and glorious bodies presents itself—when we behold an eclipse or a comet—that the greater number of us have our attention excited to the objects with which the science of Astronomy is conversant. It is at such moments that the accidental awakening of our attention should be seized upon by us, to acquire the particular knowledge relating to the circumstance by which the spirit of inquiry was roused; for we may reasonably entertain a conviction, that if we refer to some intelligent instructer, or seek for an explanation in some proper book, we shall not only satisfy ourselves upon the point in doubt, but be led forward to feel an interest in many other details, which would lay the foundation of a scientific knowledge of the laws which govern the heavenly bodies. This would be to acquire the *habit* of bestowing attention upon a subject which we had previously disregarded; and we should find this habit a source of infinite amusement and instruction, not confined, as we might have thought, to those who survey the heavens from splendid observatories, and with the help of the most perfect glasses, but equally capable of affording delight, and being of use to the wayfaring man who plods onward to his home, and to the labourer who rises to his work before the morning-star has disappeared. There will be delight wherever there is this habit of observation. But the habit will not come if we do not cultivate the spirit of inquiry. We have heard a story of a pedagogue in a small village, who, having joined a crowd anxiously engaged in watching an eclipse of the sun, and having been asked, in deference to his superior learning, what was the cause of this extraordinary

appearance, replied, "Oh! it's only a phenomenon." If, when we behold anything extraordinary in nature, we check our instinctive curiosity by saying to ourselves, "It's only a phenomenon," we shall be not one step nearer any rational knowledge of that appearance than if we had never observed it. We must inquire into the *causes* of the phenomenon, which term, *phenomenon*, properly means an appearance, anything made manifest to us in any way; and then we shall be led on to the knowledge of more phenomena, till by degrees we obtain a connected and general insight into the entire subject to which our attention was accidently directed.

It is amazing how much quickness the habit of observation will impart to the whole intellect, and how it will give it an aptitude for understanding and enjoying the thing observed. There is nothing, for instance, so common as to find men wanting in a perception of picturesque beauty; of that feeling which enables some to take great delight in a landscape, not only for its extent or the grandeur of its parts, but for that harmonious arrangement which is necessary to the effect of a picture, or for some accidental circumstances of light and shadow, or of colour, which render the prospect more than usually attractive. Now this is strictly an acquired faculty, and one which is produced by the practice of looking at nature or at the monuments of art, with this previous adaptation of the vision to picturesque objects; and a person who enjoys the faculty (we say enjoy, for it is a source of real pleasure), is said to possess a "painter's eye." It is precisely in the same way that a naturalist, by constantly observing the peculiarities of animal

life, acquires the readiest perception of the differences in the structure and habits of the great variety of living beings; and he perceives in each of them qualities which a less practised observer would entirely overlook. Through this habit of observation, the science of *Zoology*, which comprehends all that relates to the description and classification of animals, has been gradually established. By diligent observation, the peculiar structure of vast numbers of individual animals has been ascertained; their habits have been accurately described; and many ancient errors, which arose from hasty examination, have been exploded. This greater accuracy of description has produced a proportionate accuracy of classification; and though no system which attempts to arrange every variety of individual animals according to generic distinctions can be perfect, because exceptions to the rule are constantly occurring, yet an approach to perfection has been made through a more complete understanding of the organization of each species. Thus, in the more recent scientific works on Zoology, the accidental circumstances of size, or colour, or locality, or any identity in unimportant habits, have ceased to be guides in the classification of animals; but the essential peculiarities of their formation, which chiefly determine their habits, have alone been regarded. We mention this to point out that the actual observations of successive naturalists, leading to the accumulation of a great body of facts, have principally contributed to the advance of Zoology as a science in modern times; for the science being wholly founded upon observation, and not upon previous calculations,

or any series of experiments, the greater our collection of facts, the nearer have we approached to systematic perfection.

To enable an observer to make any valuable additions to this store of zoological knowledge, it is not necessary that he should be a profound anatomist, or skilful in languages, or acquainted with all the various systems of classification which have entered, perhaps too largely, into the science of Zoology in all ages. Some of the most valuable materials for our knowledge of animals have been contributed by unscientific travellers, who have been content accurately to describe what they saw and to collect the minutest particulars of the structure, and, more especially, of the habits of the rare species of quadrupeds, or birds, or reptiles, or fishes, which they had opportunities of seeing in their natural state. But it is not even necessary that a lover of nature should be a traveller, or detail the peculiarities of those creatures only with which we are not familiar to make very important additions to Zoology. One of the most instructive and amusing books in our language, "The Natural History of Selborne," was written by the Rev. Gilbert White, who for forty years scarcely stirred from the seclusion of his native village, employing his time, most innocently and happily for himself, and most instructively for the world, in the observation and description of the domestic animals, the birds, and the insects by which he was surrounded. He does not raise our wonder by stories of the crafty tiger or the sagacious elephant; but he notes down the movements of "the old family tortoise; is not indifferent to the reason why wagtails run round

cows when feeding in moist pastures;" and watches the congregating and disappearance of swallows with an industry which could alone determine the long-disputed question of their migration. Mr. White derived great pleasure from these pursuits, because they opened to his mind new fields of inquiry, and led him to perceive that what appears accidental in the habits of the animal world, is the result of some unerring instinct, or some singular exercise of the perceptive powers, affording the most striking objects of contemplation to a philosophic mind. It is in this way that every man may become a naturalist; and the great object which we propose to ourselves in the collection of the most interesting facts relating to animals in general, and in this volume of those which appertain to Quadrupeds in particular, will be to excite such a habit of observation in our readers, that they may accustom themselves to watch the commonest appearances of animal life; and thus derive, from every inquiry into which their observations may lead them, a more intimate conviction of the perfection of that Wisdom, by which the functions of the humblest being in the scale of existence are prescribed by an undeviating law.

We are not about to write a systematic work on Zoology, which shall comprise every specimen of the Animal Kingdom; but, with especial reference to the plan of diffusing *Entertaining* and Useful Knowledge, we shall rather attempt to lead the reader to a gradual acquaintance with the science, by instructing him in the peculiarities of individual animals, than to make these peculiarities subordinate to classification. We apprehend that, in

adopting this course, we pursue a natural and interesting mode of communicating a popular knowledge of the subject. It is frequently better to lead men from the example to the principle, than from the abstract principle to the example. This is the mode in which a *practical* knowledge is best attained in all things.

There are, however, a few of the great principles of Zoology, upon which the systems of classification now in most esteem are founded, which we may properly explain, in as brief and simple a manner as possible, before we proceed to individual descriptions.

The ANIMAL KINGDOM (scientifically called *kingdom*, to distinguish it as a portion of the *world* of nature in general) is divided into *vertebrated* and *invertebrated* animals. The term vertebrated is derived from *vertebræ*, the Latin name for the bones of the spine.

Vertebrated animals are, therefore, those which possess a spine, or bony covering of the spinal marrow, on the anterior part of which the cranium or covering of the brain rests. To the sides of the vertebræ are attached ribs, which form the framework of the body. Animals of this division have all red blood; a muscular heart; a mouth with a transverse opening, and of which the jaws move in the same plane; and distinct organs of vision, smell, hearing, and taste, all situated in cavities of the head. They have never more than four limbs, The division comprises Mammalia, Birds, Reptiles, and Fishes. The word *Mammalia* (having teats) applies to all animals which suckle their young, and is the proper scientific term for those which are popu-

larly called *Quadrupeds;* for the latter term is an incorrect one when applied *exclusively* to viviparous animals (producing their young in a living state) with four legs, as many of the Reptiles have also four legs. Whenever, therefore, we popularly use the term Quadrupeds, speaking generally of the class which we are at present about to describe, we mean *Mammiferous Quadrupeds.*

The Invertebrated animals are those which have no vertebræ; of all these the blood is white. They are scientifically divided into *Molluscous* animals, in which the muscles are attached to the skin, with or without the protection of a shell, such as snails and slugs; *Articulated* animals, in which the covering of the body is divided into rings or segments, to the interior of which the muscles are attached, comprehending all insects and worms; and *Radiated* animals, in which the organs of motion or sensation radiate from a common centre, such as starfish.

Each of the above four classes of Vertebrated animals have peculiarities of organization, by which they are fitted for the respective states in which they exist. The various nature of their movements is always proportioned to the quantity of respiration distinguishing each class. They thus either walk or run upon the earth, or fly through the air, or creep upon the ground, or swim in the water, as their quantity of respiration is moderate as in quadrupeds, or great as in birds, or feeble as in reptiles, or small, but modified by peculiar arrangements, as in fishes. Quadrupeds, as we before said, suckle their young, and are viviparous. The whale, and several other species, which are popularly regarded as fishes, belong to the class Mammalia, on account

of the great characteristic of suckling their young. Birds, Reptiles, and Fishes, being oviparous, or laying eggs, leave their young to other nourishment than that of their own bodies.

The peculiar organization of QUADRUPEDS will be described, as occasion offers, in our notice of the individual specimens. The Orders into which they are now more generally divided are determined, first, by the organ of touch, which regulates the ability of the animal to seize upon any object, and upon which its dexterity mainly depends; and, secondly, by those of mastication, which prescribe the nature of the food proper to each species. Linnæus, whose authority as a writer on Natural History was for a long time considered unquestionable, divided the orders of quadrupeds solely according to the peculiarities of their teeth; but this system, although natural to a certain extent, has been considered as producing great anomalies and unnatural combinations. The systems of Cuvier, Blumenbach, and other distinguished naturalists of our own day, are founded upon a consideration of the peculiarities both of the teeth and of the organs of touch. These systems, therefore, being formed with especial reference to the two great distinctions which determine the most important habits of the animal are called "natural systems." Without offering an opinion upon the relative merits of the more modern systems of classification, we subjoin for the present a general view of the principles which have guided the zoologists of the best authority.

The class of Quadrupeds admits of a division into two *tribes*:

I. Those whose extremities are divided into fingers or toes, scientifically called *Unguiculata*, from the Latin word for nail.

II. Those whose extremities are hoofed, scientifically called *Ungulata*, from the Latin word for hoof.

I. The extremities of the first tribe are armed with claws or nails, which give them a capability of grasping objects, of climbing, of burrowing. The animals thus distinguished are susceptible of great variations in their modes of subsistence; which variations are partly determined by different modifications of the power of touch, and partly by differences in the form of the cheek-teeth.

Some have extremities formed for grasping, having the faculty of opposing a thumb to the other fingers, which faculty resides in, or is communicated by, that portion of animal structure which is properly called a hand. Man possesses this faculty in the highest perfection; but monkeys and bats are distinguished by having *all* their extremities capable of this power; and they are thus called *Quadrumana*, or four-handed.

The remaining orders of the first tribe have no thumb capable of free motion; and they are classed according to the form of their cheek-teeth, which determines their choice of food.

The *Quadrumana* and the *Carnivora* (eaters of flesh) have molar or grinding-teeth (which we call cheek-teeth), canine-teeth, and cutting-teeth. Those which have the cheek-teeth feed partly or wholly on flesh, and these teeth are adapted for

cutting that substance; while the jaws are fitted together so as to move in the manner of a pair of scissors, and are incapable of any other motion than that of opening and closing again in a vertical direction. Some of these carnivorous animals, as well as other orders of the fingered quadrupeds, walk on the soles of the feet, as bears, and are called *Plantigrada;* some on the extremities of the feet, as cats, and are called *Digitigrada;* and some are web-footed, as seals, and are called *Palmata.* The remaining animals of the first tribe want the canine-teeth, and have cutting-teeth in the front of the mouth, as rats and rabbits. They are called *Rodentia* by Cuvier, which signifies *gnawing;* and *Glires* by Linnæus. Cuvier makes another division, called *Edentata*, which are defective in the incisive teeth, and of which some want the canine-teeth, and some are even destitute of teeth altogether.

Among the Unguiculata, or fingered Quadrupeds, there are very few which are used by man as food. Many of them are noxious or ferocious. The dog and the cat are the only species of the carnivorous orders which have been rendered domestic, although many have their natural instincts subdued or restrained by their contact with mankind.

II. The extremities of the Ungulata (*Hoofed* tribe) are exclusively employed to support and move the body. These animals do not possess the power of grasping objects, of climbing, or burrowing. They are all *Herbivorous*, or feeding on vegetables. Their teeth are fitted for the mastication of grain or roots, by having a flattish round upper surface; and their jaws possess the capacity of moving in

the same plane. Their teeth are also of unequal hardness, so that they have the power of crushing, like the unequal surfaces of a millstone. Cuvier divides the hoofed animals into, 1, *Pachydermata*, or thick-skinned, among which are the horse and the elephant; and, 2, *Ruminantia*, or those which ruminate or chew the cud, such as cows and sheep. Among this tribe, man, whether in a rude or civilized state, principally and almost exclusively finds his food from wild or from domesticated animals. This tribe also furnishes him with the most valuable assistance in agriculture, in the chase, and in the carriage of commodities.

In giving this very brief, and, therefore, imperfect sketch of the leading principles of classification, we have only thrown out a few hints for such of our readers as may desire, in the outset, to view the subject of Zoology as a science.

CHAPTER II.

ON MENAGERIES.

THE literal meaning of the word Menagerie points out one of the principal objects of a collection of various living animals. *Ménagerie* is derived from the French word *ménager*, from which we derive our English verb to manage. The name *Ménagerie* was originally applied to a place of domes-

tic animals, with reference to their nurture and training: it now means any collection of animals. It may be implied, therefore, that the animals in a Menagerie are not placed there merely for safe confinement, but that, by care and kindness, their noxious or ferocious propensities may there be restrained or subdued, and by constant discipline their habits may there be rendered useful, or at least inoffensive to man. Daubenton and other distinguished naturalists have believed that the ferocity of many of the carnivorous animals may be entirely conquered in the course of time; that they only flee from man through fear, and attack and devour other animals through the pressing calls of hunger; and that the association with human beings, and an abundant supply of food, would render even the lion, the tiger, and the wolf as *manageable* as our domestic animals. In support of this theory, it may be observed, that although the tiger and the domestic cat have many properties in common, the conquest of the latter species is now complete; and, farther, that some of the most ferocious animals, which have been bred in a state of confinement, or taken exceedingly young, have become perfectly tractable and harmless, with those who have rightly understood their natures. The accidents which have sometimes occurred to the attendants of wild beasts, and which are attributed to the treachery of their dispositions, have generally proceeded from an ignorance of their habits. The lion, for instance, is not an animal of acute hearing, and he is therefore awakened with difficulty, particularly after feeding. If he is suddenly aroused, he instantly loses all presence of mind,

and flies off in the direction in which he happens to be lying. A few years ago, one of the keepers at Exeter Change was killed through his ignorance of this peculiarity, which is well known to the Bushmen of Africa.* The keeper, going into the den of a lion, and suddenly awakening him, the animal, seeing no mode of escape, killed the man under the influence of his natural terror. This unfortunate circumstance did not proceed from any unconquerable ferocity in the lion; for, in general, he was obedient, and even affectionate. The habits of his species were not thoroughly understood by those around him; if it had been otherwise, the keeper would not have placed himself in a position where the discipline by which the lion had been rendered grateful would be useless, from the stronger force of a natural propensity.

But if it be too much to hope that the ferocious animals may be subdued to our uses through the education which well-conducted Menageries would afford, it cannot be doubted that such establishments offer most interesting opportunities for observing the peculiarities of a great variety of creatures, whose instincts are calculated to excite a rational curiosity, and to fill the mind with that pure and delightful knowledge which is to be acquired in every department of the study of nature. The commonest animals offer to the attentive observer objects of the deepest interest. When Montaigne, playing with his cat, says in a quaint way, "who knows whether puss is not more diverted with me than I am with puss," his mind wanders into those speculations with regard to the delicate lines which divide instinct from reason, which must naturally

* See p. 139.

arise to every one who attentively contemplates the dispositions of the inferior parts of the living creation. To those who philosophize or to those who do not, the instinct and intelligence of animals are always interesting; and to a feeling mind they are doubly so. The poet Cowper, when he sat for hours in his study watching the gambols of his three tame hares, forgot that gloom which constitutionally preyed upon him, in his sympathy with the innocent happiness of the poor beings whom he had taught, first not to fear him, and afterward to love him. These three hares, and his spaniel and cat, formed Cowper's Menagerie, and it afforded him both delight and instruction.

All associations between animals of opposite natures are exceedingly interesting; and those who train animals for public exhibition know how attractive are such displays of the power of discipline over the strength of instinct. These extraordinary arrangements are sometimes the effect of accident, and sometimes of the greater force of one instinct over the lesser force of another. A rat-catcher having caught a brood of young rats alive, gave them to his cat, who had just had her kittens taken from her to be drowned. A few days afterward, he was surprised to find the rats in the place of the drowned kittens, being suckled by their natural enemy. The cat had a hatred to rats, but she spared these young rats to afford her the relief which she required as a mother. The rat-catcher exhibited the cat and her nurslings to considerable advantage.* A somewhat similar exhibition exists at present. There is a little Mena-

* Broderip.

gerie in London, where such odd associations may be witnessed upon a more extensive scale, and more systematically conducted than in any other collection of animals with which we are acquainted. Upon the Surry side of Waterloo Bridge, or sometimes, though not so often, on the same side of Southwark Bridge, may be daily seen a cage about five feet square, containing the quadrupeds and birds which are represented in the annexed print. The keeper of this collection states that he has employed seventeen years in this business of training creatures of opposite natures to live together in content and affection. And those years have not been unprofitably employed! It is not too much to believe, that many a person who has given his halfpenny to look upon this show, may have had his mind awakened to the extraordinary effects of habit and of gentle discipline, when he has thus seen the cat, the rat, the mouse, the hawk, the rabbit, the guinea-pig, the owl, the pigeon, the starling, and the sparrow, each enjoying, as far as can be enjoyed in confinement, its respective modes of life, in the company of the others; the weak without fear, and the strong without the desire to injure. It is impossible to imagine any prettier exhibition of kindness than is here shown: the rabbit and the pigeon playfully contending for a lock of hay to make up their nests; the sparrow sometimes perched on the head of the cat, and sometimes on that of the owl, each its natural enemy; and the mice playing about with perfect indifference to the presence either of cat, or hawk, or owl. The modes by which the man has effected this, are, first, by keeping all the creatures well fed; and,

Group of Animals of opposite natures living in the same cage.

secondly, by accustoming one species to the society of the other at a very early period of their lives. The ferocious instincts of those who prey on the weaker are never called into action; their nature is subdued to a systematic gentleness; the circumstances by which they are surrounded are favourable to the cultivation of their kindlier dispositions; all their desires and pleasures are bounded by their little cage; and though the old cat sometimes takes a stately walk on the parapet of the bridge, he duly returns to his companions, with whom he has been so long happy, without at all thinking that he was born to devour any of them. This is an example, and a powerful one, of what may be accomplished by a proper education, which rightly estimates the force of habit, and confirms, by judicious management, that habit which is most desirable to be made a rule of conduct. The principle is the same, whether it be applied to children or to brutes.

Menageries may be considered among the most rational gratifications of curiosity. All classes of persons go to see these exhibitions; and it is not too much to assert that many come away with their understandings enlarged and their stores of useful knowledge increased. The animals may be confined in miserable dens, where their natural movements are painfully retsrained; the keepers may be lamentably ignorant, and impose upon the credulous a great number of false stories, full of wonderment and absurdity: but still people see the real things about which they have heard and read (though they are not always pointed out to them by their right names), and they thus acquire a body of facts

which make a striking impression upon their memories and understandings. The sagacity of the elephant and the lofty port of the lion can never be forgotten. The actual inspection of such collections of animals, too, gradually obliterates the impressions of those false accounts which the early naturalists multiplied with a fond credulity, and which, like all other mysterious stories, took the firmest hold of the popular mind. People see in these menageries a great number of rare animals, brought together from distant parts of the earth, whose habits are very curious and surprising: but they never see the Griffin, which is represented as half beast and half bird; nor the Centaur, which the poets have described as half horse and half man; nor the Phœnix, which is drawn as a bird, and is stated to perish by fire at the end of a hundred years, and then to rise again from its own ashes. They thus gradually learn to disbelieve the existence of these things, because the fables to which they have trusted never receive a confirmation from any living specimen; while, on the other hand, the statements of intelligent travellers and naturalists, which they may have also heard of, are abundantly proved by the evidence of their own senses. To acquire the habit of discriminating between what is true and what is false, to learn to separate fable from fact, to perceive what parts of literature belong to the freaks of the imagination, and what to diligent inquiry and sober reasoning, this is the very foundation of all valuable knowledge; and to obtain this habit of mind is one of the happiest consequences of that habit of obser-

vation which, as we have already said, a love for the study of nature is so fitted to call forth.

A better system of education has instructed us that there is nothing in nature beneath the attention of a reasonable being; that some of the wisest and most philosophic of mankind have devoted themselves with a passionate ardour to the cultivation of Natural History as a science; and that, if children feel the deepest interest in safely beholding those ferocious animals which form such attractive objects in many of the stories dedicated to their use, that interest may be readily carried far beyond the gratification of a passing curiosity, and may become the excitement to the acquisition of a great deal of real knowledge, capable of being presented in the most captivating form.

In the barbarous ages, and till within the last century, beasts of prey were considered the especial properties of kings, as something typical of their power and greatness. In the fortress where the crown of the ancient English monarchs was kept, were also confined their lions. These were generally maintained at the expense of the people, and sometimes of the civic officers of London, by special writ; and the keeper of the lions was a person of rank attached to the court. Gradually, this exertion of the royal prerogative fell into decay; and if a foreign potentate presented a tiger or a leopard to the king, as was often the case with the rulers of the maritime states of Africa, the animal was given to the keeper of the menagerie, to add to his stock of attractions for the public. Farther, no care was taken of the collection on the part of the sovereign or the government. It is highly credit-

able to the present keeper that he has judiciously availed himself of the growing taste for zoological pursuits, to render his collection in some degree worthy of a country possessing such opportunities of obtaining the finest specimens of animal life which the world can afford.

The kings of France had at Versailles such a menagerie as the kings of England have had in the tower. It was at this menagerie that Buffon and Daubenton studied. In 1793 the collection was so reduced, that it consisted only of a quagga, a bubale (the cervine of Pennant), a rhinoceros, a lion, and a hooded pigeon. The celebrated St. Pierre, who succeeded Buffon as keeper of the Jardin des Plantes, where there was a splendid *museum* of natural history, laboured most assiduously to add a menagerie to the establishment. He succeeded; and the collection was begun with the remnant of the royal collection of Versailles. The menagerie of Paris is now one of the principal attractions of that capital. In the number of its specimens, in the convenience of its arrangements, and in the large scale of its accommodation for the animals according to their respective natures, it is infinitely superior to any other menagerie, and is therefore deservedly visited by all foreigners. St. Pierre, among the arguments which he employed for the formation of this establishment, says, "Colbert attracted many strangers to our capital by the fêtes which he gave to Lewis XIV.; a free nation ought to invite them thither by the schools of useful knowledge which it opens to the human race." His arguments were successful.

The establishment of the *Ménagerie* at the Jar-

din des Plantes has afforded opportunities for the study of natural history, which have advanced the branch of the science that relates to quadrupeds in a most remarkable degree. The accurate descriptions of Cuvier, of Geoffroy, of Desmarest, and ot other distinguished naturalists of France, are principally to be ascribed to their diligent studies in this school. Buffon was one of the most eloquent of natural historians. Wherever he describes, from actual observation, the appearance, the instincts, and the habits of animals, he is interesting not only to the learned, but to the least informed reader. The greater part of what is really valuable in his writings is derived from the accurate study of some individual specimen; and his most splendidly coloured portraits are those for which he had living models. But such opportunities of gathering materials for fresh and vivid description, from real, animated nature, were oftentimes wanting to Buffon. He occasionally writes from vague and uncertain narratives; and then, as might be expected, he is superficial and full of false theories. His successors have had more extended opportunities of observation; and the accuracy of their facts, therefore, leaves us less reason to regret the absence of those charms of style which render Buffon one of the most delightful of writers.

The five animals which remained of the menagerie of Versailles were offered to St. Pierre, as keeper of the *Cabinet* of Natural History, to form *skeletons* to be added to that collection. He wisely seized upon the opportunity to combat a prejudice which then existed, and which even still exists, that stuffed specimens and anatomical preparations are

quite as valuable for the purposes of science as living animals. Comparative anatomy, which is doubtless an important part of natural science, may certainly be studied in museums; but when the argument is carried farther by those naturalists who say, "It is sufficient to have the means of examining *dead* animals, for by such we may learn to distinguish the species and the kinds of each, as well as from living specimens," the indignant answer of St. Pierre is worthy attention.*

"Those who have studied nature only in books can see only their books in nature; they look upon the natural world only to find therein the names and the characters of their systems. If they are botanists, they are satisfied to have discovered a plant of which some author has spoken; and having assigned it to the class and the order which he has pointed out, they gather it, and, spreading it between two bits of gray paper, they sit down content with their knowledge and their researches. They do not form a herbal to study nature, but they study nature to form a herbal. It is in the same way that they make collections of animals, that they may learn their genera and their species, and treasure up their names.

"But can he be a lover of nature who thus studies her wonderful works? How great a difference is there between a dead vegetable, dry, faded, discoloured, whose stems, and leaves, and flowers are crumbling to powder, and a living vegetable, full of sap, which buds, flowers, gives forth perfume, fructifies, and sows itself again; maintains a universal harmony with the elements, with insects,

* Mémoire sur la Ménagerie. Œuvres de St. Pierre, tom. xii., p. 654. Paris, 1818.

with birds, with quadrupeds, and, combining with a thousand other vegetables, crowns our hills and adorns our river banks!

"Can we recognise the verdure and the flowers of a meadow in a haystack? or the majesty of the trees of a forest in a bundle of fagots? The animal loses by death even more of its characteristics than the vegetable: for the animal has received a more vigorous portion of life. Its principal qualities vanish; its eyes are shut, its pupils are dim, its limbs are stiff; it is without warmth, without motion, without feeling, without voice, without instinct. What a difference between the animal who enjoys the light, distinguishes objects, moves towards them, calls the female, couples, makes its nest or lair, brings up its young, defends them from their enemies, congregates with its kind, and gives music to our woods and animation to our meadows! Do you recognise the lark, gay as the breath of morning, who, at 'heaven's gate sings,' when he is suspended from the beak upon a bit of packthread; or the bleating sheep and the labouring ox in the well-dressed limbs of a butcher's shop? The best prepared animal only offers a stuffed skin and a skeleton. The life is wanting by which he was classed in the animal kingdom. The stuffed wolf may preserve his teeth, but the peculiar instinct which determined his ferocious character is gone, and he then scarcely differs from the friendly dog."

There is much truth in these remarks, and their good sense ought not to be overlooked, though the style in which it is conveyed be somewhat declamatory. For all popular purposes, menageries offer much more interesting modes of studying

some parts, and those the most important, of the animal kingdom, than the best museum. In this sense the homely saying is quite correct, that "a living dog is better than a dead lion."

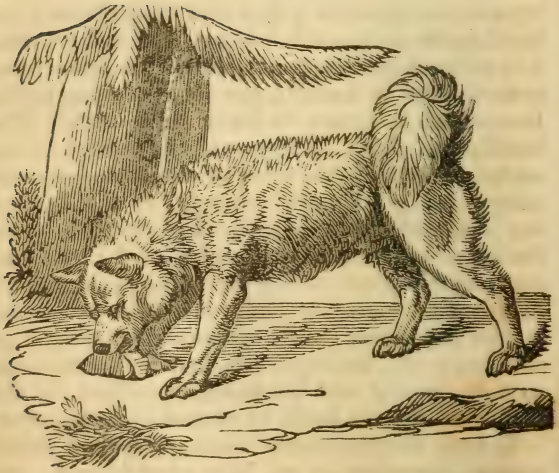
It will be the object of this little book to promote a taste for natural history, by giving faithful descriptions of living animals, by rejecting all fabulous and doubtful relations, and by leading onward to a more scientific knowledge, through the medium of what appears to combine the entertaining with the useful. We first desire to fix the habit of attention upon natural objects. To effect this, we shall attempt to present some of those objects to the mind in a way that may excite a rational curiosity towards what is rare and wonderful; never forgetting to direct it, at the same time, towards what is familiar, but not less remarkable. Everything in nature is full of instruction. The intelligence of the elephant and the instinct of the spider are equally deserving of observation and inquiry; and are equally examples of the wisdom and power of Him who said, "Let the earth bring forth the living creature after his kind, cattle, and creeping thing, and beast of the earth after his kind." It is for this cause especially that we consider attention can never be ill bestowed, whether it be directed to the habits of our humble companions, such as the dog and the horse, or excited by the rarities of foreign lands, as viewed in menageries.

In such establishments there are various measures of attraction, as we have already seen; but there are none without some interest. Even the wandering Italian, who exhibits his bird and his dog to every by-stander, has something to show

which may exemplify the force of instinct or of habit, and thus teach us some one of the lessons which the whole Book of Nature offers to him who will read it aright.

CHAPTER III.

THE DOG.



Esquimaux dog. Canis familiaris Borealis.—DESMAREST.

IN the garden of the Zoological Society are some remarkably fine specimens of dogs; and one of the

finest and most interesting is the dog of the Esquimaux. Peter (so he is called) was brought to England by Lieut. Henderson, R.N., one of the companions of Captain Ross. This variety of dog most nearly resembles the shepherd's dog and the wolf-dog. The ears are short and erect; the tail is bushy, and carried in a graceful curve over the back: in this particular the Esquimaux dog principally differs from the wolf of the same district, whose tail is carried between his legs in running. The tail *turned upward* is the distinguishing characteristic of the domestic dog of every variety. It has been considered by some naturalists that these dogs are wolves in a state of domestication. The anatomy of both, for the most part, corresponds; the wolf is, however, larger and more muscular. The average height of the Esquimaux dog is one foot, ten inches; the length of his body, from the occiput (the back of the head) to the insertion of the tail, two feet, three inches; and of the tail itself, one foot, one inch. The dog in the Zoological Garden is of a white colour, with somewhat of a yellow tinge. Some of the Esquimaux dogs are brindled, some black and white, some almost entirely black, and some are of a dingy red. Their coat is thick and furry; the hair, in winter, being from three to four inches long: nature has also provided them with an under coating of close soft wool at that season, which they lose in spring; so that they endure their climate with comparative comfort. They never bark, but have a long, melancholy howl, like the wolf. They are familiar and domestic, but snarl and fight among themselves much more than dogs in general. The specimen

in the Zoologicol Garden is good-tempered, and delights to be noticed and caressed, even by strangers.

The Esquimaux, a race of people inhabiting the most northerly parts of the American continent and the adjoining islands, are dependant upon the services of this faithful species of dog for most of the few comforts of their lives; for assistance in the chase; for carrying burdens; and for their rapid and certain conveyance over the trackless snows of their dreary plains. The dogs, subjected to a constant dependance upon their masters, receiving scanty food and abundant chastisement, assist them in hunting the seal, the reindeer, and the bear. In the summer, a single dog carries a weight of thirty pounds in attending his master in the pursuit of game: in winter, yoked in numbers to heavy sledges, they drag five or six persons at the rate of seven or eight miles an hour, and will perform journeys of sixty miles a day. What the reindeer is to the Laplander, this dog is to the Esquimaux. He is a faithful slave, who grumbles, but does not rebel; whose endurance never tires; and whose fidelity is never shaken by blows and starving. These animals are obstinate in their nature: but the women, who treat them with more kindness than the men, and who nurse them in their helpless state or when they are sick, have an unbounded command over their affections; and can thus catch them at any time, and entice them from their huts to yoke them to the sledges, even when they are suffering the severest hunger, and have no resource but to eat the most tough and filthy remains of animal matter which they can espy on their laborious journeys.

The mode in which the Esquimaux dogs are employed in drawing the sledge is deseribed in a very striking manner by Captain Parry, in his "Journal of a Second Voyage for the discovery of a North-west passage." We should diminish the value of the narrative were we to abridge it.

"When drawing a sledge, the dogs have a simple harness (*annoo*) of deer or seal skin, going round the neck by one bight, and another for each of the fore legs, with a single thong leading over the back, and attached to the sledge as a trace. Though they appear at first sight to be huddled together without regard to regularity, there is, in fact, considerable attention paid to their arrangement, particularly in the selection of a dog of peculiar spirit and sagacity, who is allowed, by a longer trace, to precede the rest as leader, and to whom, in turning to the right or left, the driver usually addresses himself. This choice is made without regard to age or sex; and the rest of the dogs take precedence according to their training and sagacity, the least effective being put nearest the sledge. The leader is usually from eighteen to twenty feet from the fore part of the sledge, and the hindmost dog about half that distance; so that when ten or twelve are running together, several are nearly abreast of each other. The driver sits quite low, on the forepart of the sledge, with his feet overhanging the snow on one side, and having in his hand a whip, of which the handle, made either of wood, bone, or whalebone, is eighteen inches, and the lash more than as many feet, in length: the part of the thong next the handle is platted a little way down to stiffen it and give it a spring, on which

much of its use depends; and that which composes the lash is chewed by the women, to make it flexible to frosty weather. The men acquire from their youth considerable expertness in the use of this whip, the lash of which is left to trail along the ground by the side of the sledge, and with which they can inflict a very severe blow on any dog at pleasure. Though the dogs are kept in training entirely by fear of the whip, and, indeed, without it would soon have their own way, its immediate effect is always detrimental to the draught of the sledge; for not only does the individual that is struck draw back and slacken his trace, but generally turns upon his next neighbour, and this, passing on to the next, occasions a general divergence, accompanied by the usual yelping and showing of the teeth. The dogs then come together again by degrees, and the draught of the sledge is accelerated; but even at the best of times, by this rude mode of draught, the traces of one third of the dogs form an angle of thirty or forty degrees on each side of the direction on which the sledge is advancing. Another great inconvenience attending the Esquimaux method of putting the dogs to, besides that of not employing their strength to the best advantage, is the constant entanglement of the traces by the dogs repeatedly doubling under from side to side to avoid the whip; so that, after running a few miles, the traces always require to be taken off and cleaned.

"In directing the sledge, the whip acts no very essential part, the driver for this purpose using certain words, as the carters do with us, to make the dogs turn more to the right or left. To these a

good leader attends with admirable precision, especially if his own name be repeated at the same time, looking behind over his shoulder with great earnestness, as if listening to the directions of the driver. On a beaten track, or even where a single foot or sledge mark is occasionally discernible, there is not the slightest trouble in guiding the dogs: for even in the darkest night and in the heaviest snowdrift there is little or no danger of their losing the road, the leader keeping his nose near the ground, and directing the rest with wonderful sagacity. Where, however, there is no beaten track, the best driver among them makes a terrible circuitous course, as all the Esquimaux roads plainly show; these generally occupying an extent of six miles, when, with a horse and sledge, the journey would scarcely have amounted to five. On rough ground, as among hummocks of ice, the sledge would be frequently overturned or altogether stopped if the driver did not repeatedly get off, and, by lifting or drawing it to one side, steer clear of those accidents. At all times, indeed, except on a smooth and well-made road, he is pretty constantly employed thus with his feet, which, together with his never-ceasing vociferations and frequent use of the whip, renders the driving of one of these vehicles by no means a pleasant or easy task. When the driver wishes to stop the sledge, he calls out 'Wo, woa,' exactly as our carters do, but the attention paid to this command depends altogether on his ability to enforce it. If the weight is small and the journey homeward, the dogs are not to be thus delayed; the driver is therefore obliged to dig his heels in the snow to obstruct their progress, and,

having thus succeeded in stopping them, he stands up with one leg before the foremost crosspiece of the sledge, till, by means of laying the whip gently over the dog's head, he has made them all lie down. He then takes care not to quit his position, so that, should the dogs set off, he is thrown upon the sledge instead of being left behind by them.

"With heavy loads, the dogs draw best with one of their own people, especially a woman, walking a little way ahead; and in this case they are sometimes enticed to mend their pace by holding a mitten to the mouth, and then making the motion of cutting it with a knife and throwing it on the snow, when the dogs, mistaking it for meat, hasten forward to pick it up. The women also entice them from the huts in a similar manner. The rate at which they travel depends, of course, on the weight they have to draw and the road on which their journey is performed. When the latter is level, and very hard and smooth, constituting what, in other parts of North America, is called 'good sleighing,' six or seven dogs will draw from eight to ten hundred weight, at the rate of seven or eight miles an hour, for several hours together; and will easily, under these circumstances, perform a journey of fifty or sixty miles a day. On untrodden snow, five-and-twenty or thirty miles would be a good day's journey. The same number of well-fed dogs, with a weight of only five or six hundred pounds (that of the sledge included), are almost unmanageable, and will, on a smooth road, run any way they please, at the rate of ten miles an hour. The work performed by a greater number of dogs is, however, by no means in proportion to this, owing

to the imperfect mode already described of employing the strength of these sturdy creatures, and to the more frequent snarling and fighting occasioned by an increase of numbers."

Esquimaux Dogs and Sledge.

The dogs of the Esquimaux offer to us a striking example of the great services which the race of dogs has rendered to mankind in the progress of civilization. The inhabitants of the shores of Baffin's Bay, and those still more inclement regions to which our discovery ships have recently penetrated, are perhaps never destined to advance much farther than their present condition in the scale of humanity. Their climate forbids them attempting the gratification of any desires beyond the commonest animal wants. In the short summers, they hunt the reindeer for a stock of food and clothing; during the long winter, when the stern demands of hunger drive them from their snow huts to search for provisions, they still find a supply in the reindeer, in the seals which lie in holes under the ice of the lakes, and in the bears which prowl about

on the frozen shores of the sea. Without the exquisite scent and undaunted courage of their dogs, the several objects of their chase could never be obtained in sufficient quantities during the winter to supply the wants of the inhabitants; nor could the men be conveyed from place to place over the snow with that celerity which greatly contributes to their success in hunting. In drawing the sledges, if the dogs scent a reindeer even a quarter of a mile distant, they gallop on furiously in the direction of the scent; and the animal is soon within reach of the unerring arrow of the hunter. They will discover a seal-hole entirely by the smell at a very great distance. Their desire to attack the ferocious bear is so great, that the word *nennook*, which signifies that animal, is often used to encourage them when running in a sledge; two or three dogs, led forward by a man, will fasten upon the largest bear without hesitation. They are eager to chase every animal but the wolf; and of him they appear to have an instinctive terror, which manifests itself, on his approach, in a loud and continued howl. Certainly there is no animal which combines so many properties useful to his master as the dog of the Esquimaux.

With the exception of that most serviceable property of drawing and carrying burdens, most of the various races of dogs have, in a singular manner, assisted mankind in subduing the earth. In our own country, the wolf, the brown bear, and the boar were once common; they are now extirpated. This result, without which civilization must have very slowly advanced, could not have been effected without the assistance of the dog. Cuvier,

the great French naturalist, says, "the dog is the most complete, the most remarkable, and the most useful conquest ever made by man. Every species has become our property; each individual is altogether devoted to his master, assumes his manners, knows and defends his goods, and remains attached to him until death; and all this proceeds neither from want nor constraint, but solely from true gratitude and friendship. The swiftness, the strength, and the scent of the dog have created for man a powerful ally against other animals, and were, perhaps, necessary to the establishment of society. He is the only animal which has followed man through every region of the earth." Buffon says, "The art of training dogs seems to have been the first invented by man; and the result of it was the conquest and peaceable possession of the earth." But this art would never have become perfectly successful and completely universal, had there not been in the race of dogs a natural desire to be useful to man; an aptitude for his society; a strong and spontaneous longing for his friendship. Burchell, a distinguished traveller in Africa, has observed, that we never see in various countries an equal familiarity with other quadrupeds, according to the habits, the taste, or the caprice of different nations; and he then concludes, that the universal friendship of the man and the dog must be the result of the laws of nature. With singular propriety, therefore, has the name *Canis familiaris*—domestic or familiar dog—been assigned by Linnæus to the species.

The dogs of the Esquimaux lead always a fatiguing, and often a very painful life. They are

not, like the Siberian dogs (to which they bear a considerable resemblance), turned out in the summer to seek their own sustenance: at that period they are fat and vigorous; for they have abundance of *kaow*, or the skin and part of the blubber of the walrus.* But their feeding in winter is very precarious. Their masters have but little to spare; and the dogs become miserably thin, at a time when the severest labour is imposed upon them. It is not, therefore, surprising that the shouts and blows of their drivers have no effect in preventing them from rushing out of their road to pick up whatever they can descry; or that they are constantly creeping into the huts to pilfer anything within their reach: their chances of success are but small; for the people within the huts are equally keen in the protection of their stores, and they spend half their time in shouting out the names of the intruders (for the dogs have all names), and in driving them forth by the most unmerciful blows. This is a singular, but, from the difference of circumstances, not unnatural contrast to the treatment of dogs described in Homer. The princes of the Trojan war allowed their dogs to wait under their tables, to gather up the remains of their feasts. In the twenty-third book of the Iliad, it is mentioned that Patroclus had no fewer than nine such humble retainers. The same princes, too, as we learn in the tenth book of the Odyssey, carried home to their dogs the fragments which fell from the tables

* The attachment of these dogs to the taste and smell of fat is as remarkable as the passion of Cossacks for oil. At Chelsea there are two domesticated Esquimaux dogs, that will stand, hour after hour, in front of a candlemaker's workshop, snuffing the savoury effluvia of his melting tallow.

of their entertainers. Among these fragments were the soft and fine parts of bread, called *απομαγδαλιαι*, with which the guests wiped their fingers when the meal was finished, and which were always a perquisite to the dogs. In allusion, probably, to this custom, the woman of Canaan says, "the dogs eat of the crumbs which fall from their master's table."

The hunger which the Esquimaux dogs feel so severely in winter is somewhat increased by the temperature they live in. In cold climates, and in temperate ones in cold weather, animal food is required in larger quantities than in warm weather and in temperate regions. The only mode which the dogs have of assuaging or deceiving the calls of hunger, is by the distension of the stomach with any filth which they can find to swallow. The wolves and reindeer of the polar countries, when pressed by hunger in the winter, devour clay. The Kamtschatkans sometimes distend their stomachs with sawdust. Humboldt relates that the Otomacs, during the periodical inundation of the rivers of South America, when the depth of the water prevents their customary occupation of fishing, appease their hunger, even for several months, by swallowing a fine unctuous clay, slightly baked. Many other instances of this nature are given in Dr. Elliotson's learned and amusing notes to his edition of Blumenbach's Physiology. The painful sense of hunger is generally regarded as the effect of the contraction of the stomach, which effect is constantly increased by a draught of cold liquid. Captain Parry mentions, that in winter the Esquimaux dogs will not drink water unless it happen to

be oily. They know by experience that their cravings would be increased by this indulgence, and they lick some clean snow as a substitute, which produces a less contraction of the stomach than water. Dogs, in general, can bear hunger for a very long time without any serious injury, having a supply of some substance for the distension of their stomachs. It is mentioned in the Memoirs of the French Academy of Sciences, that a bitch, which had been shut up and forgotten in a country house, was sustained for forty days without any nourishment beyond the wool of a quilt, which she had torn in pieces. A dog has been known to live thirty-six days without food or substitute for food.

We have already noticed that the Esquimaux dogs do not bark. This is a peculiarity of many varieties of the dog, but very rarely of those which are natives of temperate countries. Probably this is an effect of high as well as of low temperature. Sonnini says, that the people of Upper Egypt have a species of dog resembling the shepherd's dog, with voices so weak that their barking can scarcely be heard. Columbus observed, that the voices of the dogs which he took to the West Indies became feeble. In both cases the tropical climate probably produced this result. The prophet Isaiah alludes to this peculiarity in his denunciation of idle instructers: "They are dumb dogs, and cannot bark."

The inhabitants of Holland and the Netherlands have long been accustomed to the use of dogs for purposes of draught. Pennant mentions, that in those countries they draw little carts to the herb-markets. In London, within these few years, the

use of dogs in dragging light vehicles has become very general; and though their strength is rarely employed in combination, as is the case with the Esquimaux sledge-dogs, their energy makes them capable of moving very considerable weights. There are many bakers in the more populous parts of London who have a travelling shop upon wheels, drawn by one or two stout mastiffs or bulldogs. But the venders of cat's-meat appear to have de-

rived the largest benefit from this application of animal power. The passenger through the narrow streets and lanes of London is often amused by the scenes between the consumers of the commodity and those who bring it to the houses. At the well-known cry of the dealer, the cats of a whole district are in activity, anxiously peeping out of the doors for the expected meal, and sometimes

fearlessly approaching the little cart, without apprehension of their supposed enemy who draws it.

The dogs attached to these carts appear to have no disposition to molest the impatient groups of cats which gather around them. The habit of considering dogs and cats as natural enemies has tended to the production of a great deal of cruelty. It is true that dogs will, by instinct, pursue anything which flies from them; and puppies will thus run after, and frequently kill, chickens. But dogs, by chastisement, may be made to comprehend that nothing *domestic* must be molested.

The Newfoundland dogs, one of the most active and sagacious varieties, are employed in their native districts to draw carts and sledges laden with wood and fish, and to perform a variety of useful offices, in the place of the horse. In many of the northern countries, the bold and powerful races of dogs are thus rendered peculiarly valuable. A century ago, nearly all the travelling intercourse of Canada was carried on by dogs. The superiority of the Newfoundland dogs in swimming is well known: they are semi-webbed between the toes, which mechanism of the foot is of the greatest advantage to them; presenting, as it does, an extended surface to press away the water from behind, and then collapsing when it is drawn forward previous to taking the stroke. The hereditary habits of these dogs, too, eminently qualify them for swimming or rowing through the water, as the action is more correctly described by Sir Everard Home. It is thus that we have the most abundant instances of human life being saved by these generous and courageous animals. All dogs, how-

ever, can swim; although some dislike the water, and take to it with difficulty at the bidding of their masters. The bulldog would appear the least likely to combat with a heavy sea, as the Newfoundland dogs often do; and yet the following circumstance is well authenticated: On board a ship, which struck upon a rock near the shore during a gale, there were three dogs, two of the Newfoundland variety, and an English bulldog, rather small in growth, but very firmly built and strong. It was important to have a rope carried ashore; and as no boat could live for an instant in the breakers towards the land, it was thought that one of the Newfoundland dogs might succeed; but he was not able to struggle with the waves, and perished. The other Nowfoundland dog, upon being thrown overboard with the rope, shared a similar fate. But the bulldog, though not habituated to the water, swam triumphantly to land, and thus saved the lives of the persons on board. Among them was his master, a military officer, who still has the dog in his possession.

The changes in the quantity and colour of their clothing, which almost all polar animals undergo with the change of the seasons, is one of the most remarkable and beautiful provisions of nature. The fur, or wool, or feathers, with which quadrupeds and birds are covered, is regulated generally as to its quality and quantity by the temperature of the region which the animal inhabits. The dogs of Guinea, the Indian sheep, and the African ostrich, are so thinly clothed, that they may be considered almost naked. The temperature of their bodies is thus necessarily diminished in proportion

to the heat of the climate in which they live. The Iceland sheep and the Esquimaux dog, on the contrary, are covered with a warm coat, both of hair and wool, which enables them to bear the most intense cold without much inconvenience. Previous to winter, the hair of all animals is increased in quantity and length, and the more they are exposed the greater is the increase. Horses and cows housed during the winter, have short and thin hair in comparison with those exposed to the weather, whose coats become shaggy. The groom is aware of this arrangement of nature, and he redoubles his labour in winter to give his horse a fine coat, and thus to render him unfit for exposure to the cold. The agents of the Hudson's Bay Company, who annually transmit to Europe many thousands of the most valuable furs, will only purchase of the Indians, with whom they traffic, those which are obtained during the winter. The furs of those animals of North America which are killed in the summer are quite unfit for purposes of commerce, and they are of an inferior quality early in the winters of unusual mildness. The growth of the hair is dependant upon the temperature of the atmosphere; and thus the skins of hares and rabbits with us are seldom ripe in the fur, as it is called, till frosty weather has set in. The moulting of birds, which takes place previous to winter, after their young are reared, is a similar provision of nature. By the renewal of the feathers, a sufficient covering is afforded to enable them to bear the approaching change of season.

The changes of *colour* in many of the polar animals, and in others with which we are more fa-

miliar, though an undisputed fact, is not generally understood as proceeding from the same principle of adaptation to the change of season as the increase in the quantity of their clothing. The Alpine hare, which is found in Scotland, is in summer of a tawny gray; in winter it becomes of a snowy white. The ermine, which is also found in the British islands, has its summer coat of a reddish brown; in winter it affords the beautiful white fur which is so generally known, and with which the robes of the English judges are adorned. Every one is aware that in summer a black hat produces a much stronger sense of heat to the wearer than a white one. The same thing occurs to animals of a black and white colour. If they are placed in a higher temperature than that of their own bodies, the heat will enter the one that is black with the greatest rapidity, and elevate its temperature very much above that of the other. When these animals, on the contrary, are placed in a situation where the temperature is considerably lower than that of their own bodies, the black animal will give out its heat by radiation to every surrounding object colder than itself much more quickly than the white animal. The surface which reflects heat most readily, as in objects of a white colour, suffers it to escape but slowly by radiation; and it is for this reason that the white animal has its temperature reduced most slowly in the winter.* The change of colour in the clothing of some quadrupeds and birds

* See Fleming's Philosophy of Zoology, vol. ii. The protection of the animal from pursuit is by some considered another end answered by the colour resembling that of the surrounding snow.

exposed to severe cold, as well as the increase in the quantity of their outward protection against its effects, forms one of those beautiful provisions of the Author of nature which we recognise in every examination of his works, but which we sometimes overlook in our hasty notice of ordinary appearances, without regard to the causes from which they spring.

Many of the dogs of the northern regions can only be considered as half-domesticated. The Esquimaux dogs, and those of the Laplanders, are indeed faithful to their masters, return caresses for blows, and are, to a certain extent, obedient; but even these rebel against authority, and fear no chastisement when they desire to satisfy their voracious appetites. The probability is, that they would be entirely obedient if they were regularly fed. As man in a highly civilized state acquires the greatest command over his instinctive powers, so the inferior animals, and dogs in particular, partake of this effect of civilization. An English household dog will enter a larder even when hungry, and not touch the provisions which he finds unguarded; the Esquimaux dog, on the contrary, is always contending with the family of his master for a share of their scanty fare. An experienced pointer passes by the place from which he has seen a covey spring without indulging the feelings which must be aroused by the scent which the birds have left behind; the Esquimaux dog often drags away his sledge in the direction of a reindeer or a seal, quite uncontrollable by his surly master. Perhaps the education of each variety may have much to do with this. Those who have

studied the training of sporting dogs have observed that gentle chastisements, often repeated and mixed with kindness, produce the most perfect obedience, while hasty severity frightens the animal for the moment, but leaves no permanent impression. The feeding of a kennel of fox-hounds is one of the most striking illustrations of the power of training to produce complete obedience. The energy and even fierceness of these dogs cannot be overlooked; there is nothing slavish and crouching in their demeanour. They are hungry, and they know they are about to be fed; but they manifest no rebellious impatience. The feeder stations himself at the door which separates the outer kennel from the feeding room. At his presence a cry of joy is set up by the whole pack, but it is instantly silenced at his command. He calls "Juno;" Juno passes out: "Ponto;" Ponto follows; and so on through the pack, even if there be thirty couple. If a young dog should attempt to go out of his order, he is turned back; he recollects the punishment, and he seldom again transgresses. The pack has arrived at this state of perfect discipline by gentle correction, and, what is more important, by a system of *mutual instruction*, if we may venture so to express this particular force of example.

The dogs of Kamtschatka, as described in Von Langsdorff's Travels, when, in summer, they are not wanted to draw the sledges of the inhabitants, are left to rove at large and find their own food. They keep on the seashore or in the neighbourhood of rivers, lurking after fish, and standing in the water up to their bellies: when they see a fish, they snap at it with unerring aim. In the autumn

they return of their own accord to their particular owners in the villages. Hunger may have something to do with this voluntary resignation of their liberty after their absolute freedom; and the author from whom we gather these particulars attributes the circumstance wholly to hunger; but it appears to us that habit contributes an equally powerful motive, and that the two motives both operate. A herd of cows, that come of their own will to the farmyard at milking time, from a distant pasture, desire to be relieved of the burden of their swollen udders; and they know from habit, and the example of other cows who have thus acted, in what manner and at what period that relief will be afforded them. Many of the inferior animals have a distinct knowledge of time. The sun appears to regulate the motions of those which leave their homes in the morning, to return at particular hours of the evening. The Kamtschatka dogs are probably influenced in the autumnal return to their homes by a change of temperature. But in those animals possessing the readiest conceptions, as in the case of dogs in a highly civilized country, the exercise of this faculty is strikingly remarkable. Mr. Southey, in his Omniana, relates two instances of dogs that had acquired such a knowledge of time as would enable them to count the days of the week. He says, "My grandfather had one which trudged two miles *every Saturday* to cater for himself in the shambles. I know another more extraordinary and well-authenticated example. A dog, which had belonged to an Irishman, and was sold by him in England, would never touch a morsel of food *upon Friday*." A gentleman has men-

tioned to us, that, when a boy, he had a dog which, being in the habit of attending church regularly with his father's bailiff, in a parish some distance from Edinburgh, whenever he was with the family in Edinburgh would start off on a *Saturday* to the bailiff's house, that he might not lose his privilege and would punctually return. The same faculty of recollecting intervals of time exists, though in a more limited extent, in the horse. We knew a horse (and have witnessed the circumstance) which, being accustomed to be employed once a week on a journey with the newsman of a provincial paper, always stopped at the houses of the several customers, although they were sixty or seventy in number. But, farther, there were two persons on the route who took one paper between them, and each claimed the privilege of having it first on the alternate Sunday. The horse soon became accustomed to this regulation; and, although the parties lived two miles distant, he stopped once a fortnight at the door of the half-customer at Thorpe, and once a fortnight at that of the other half-customer at Chertsey, and never did he forget this arrangement, which lasted several years, or stop unnecessarily when he once thoroughly understood the rule.

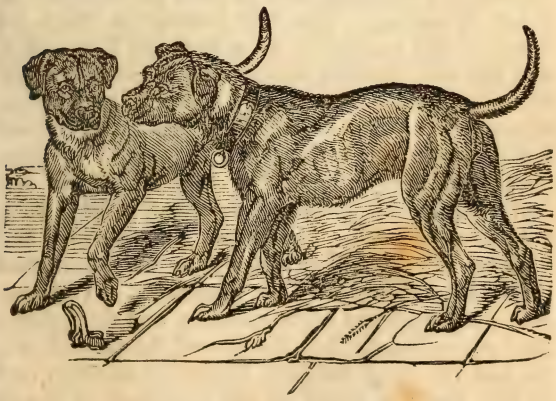
The natural habits of the species, even in dogs, are not *entirely* overcome by domestication. The well-fed dog, however he may know from experience that he shall receive a regular meal from the hand of his master, often hides his food although, perhaps, he never returns to his concealed stores: this is an hereditary habit, transmitted to him from a distant period, when his species were dependant upon chance for the supply of their necessities. The

Australasian dog, which is taken from a country imperfectly civilized, and which has, perhaps, lived in packs, associated in the pursuit of the penguin and the kangaroo, cannot readily put on the subordination of the mastiff or the spaniel. Even among the best disciplined domestic dogs of our own country, the ancient instinct, which renders them beasts of prey, sometimes breaks out. We recollect several instances within our knowledge of house-dogs having taken, as the farmers expressed it, to worrying sheep; they would do this slily, and would sometimes effect the most lamentable destruction. There is no remedy short of the capital punishment of such offenders, for they can never be broken of the habit when it has been once indulged.

Not only are natural habits transmitted especially to dogs by their parents, but even some of their acquired qualities. The pointer is of Spanish origin; and those of the stanchest kind in this country are crossed with the fox-dog, to increase their speed. The natural instinct of the pointer, as seen at the present day in the true Spanish race, is to wind game; to steal upon them by surprise; and then, pausing for an instant, to spring upon them with an unerring aim derived from this pause. The crossed breed is less disposed, by its original nature, to stop at game than the Spanish progenitor. But education has converted the rapid rest and spring of the original Spanish pointer into the fixed and deliberate rest of the stanch dog: as a writer on this subject has quaintly but forcibly expressed it, "this sort of semicolon in his proceedings man converts into a full stop." The *cultivated* stanch-

ness of the pointer is inherited by his puppy, which may be seen earnestly standing at pigeons or sparrows in a farmyard: he inherits the acquired faculty of his parent, and his master afterward gives it a direction.

There is a pair of very beautiful mastiffs from Cuba in the garden of the Zoological Society. During the summer they were chained to separate kennels, as mastiffs usually are; through the winter they have been placed in a den, perfectly sheltered from the weather. In their general form they very much resemble the English mastiff, the *Canis familiaris Anglicus* of Desmarest, whose principal characteristics are a very short head, similar, in a great degree, to the head of the bulldog, the dis-



Spanish Mastiffs from Cuba.

tinctive mark of which is a flat forehead; the ears pendant and never erect; the lips falling, covering

the lower jaw; the extremity of the tail turned upward; a fifth claw on the hind foot, more or less developed; the nostrils separated one from another by a very deep furrow; the hair generally close and short; the colour various. The Cuba mastiffs above represented are of a rufous brown, extremely beautiful, with their muzzles approaching to a jet black; they are tractable and gentle.

The bare mention of the dogs of South America must call up some of the most painful recollections in the history of the human race. The dog was entirely unknown to the inhabitants of the New World before the period when it was introduced there by the Europeans; if we except an extremely small species, called the Alco, which the Peruvians are represented to have domesticated as a sort of lapdog. The only description which we have of this animal is in a work by Fernandez, and the rude drawing which is there given of it enables us to form no accurate notion of its peculiar character. At the Island of St. Martha, Columbus found, according to Herrera's History of the Discovery of America, "many dogs which did not bark:" these are generally supposed to have been a species of wolf. The horse, the ox tribe, and the hog, were equally unknown to the Americans before the discovery by the Spaniards. The conquerors introduced each species; and they multiplied so amazingly, that the horses, the horned cattle, and the hogs overran the whole country, and to this day are found on the continent of South America in numerous herds; the horses always ready for the service of the natives, who are the best riders in the world; and the bullocks con-

stantly offering a supply of food, and so numerous, that they are sometimes slaughtered for their hides alone. The number of dogs is much lessened; but a century and a half ago, in Hispaniola (now called Hayti), Cuba, and all the Caribbee Islands, they were in such quantities, that they were occasionally destroyed to prevent their ravages upon the calves and foals of the wild cows and mares. According to the relations of the American voyagers of the seventeenth century, these dogs hunted in packs of fifty or sixty, and they would attack a herd of wild boars without any fear. The late bishop of Calcutta, Reginald Heber, in his Journal, confirms a statement which used to be doubted as to the wild dogs of India hunting ferocious beasts. He states, upon the authority of the Khaysa peasants, near the Chinese frontier, that a tiger is often killed and torn to pieces by large packs of these dogs, which give tongue, and possess a very fine scent.

The circumstances attending the introduction of dogs into the South American continent and islands, and their subsequent wild state, are thus described in a singular book, "The History of the Bucaniers."

"But here the curious reader may, perhaps, inquire how so many wild dogs came here. The occasion was, the Spaniards having possessed these isles, found them peopled with Indians, a barbarous people, sensual and brutish, hating all labour, and only inclined to killing and making war against their neighbours, not out of ambition, but only because they agreed not with themselves in some common terms of language; and perceiving the

dominion of the Spaniards laid great restrictions upon their lazy and brutish customs, they conceived an irreconcilable hatred against them, but especially because they saw them take possession of their kingdoms and dominions; hereupon they made against them all the resistance they could, opposing everywhere their designs to the utmost; and the Spaniards finding themselves cruelly hated by the Indians, and nowhere secure from their treacheries, resolved to extirpate and ruin them, since they could neither tame them by civility nor conquer them with the sword. But the Indians, it being their custom to make their woods their chief places of defence, at present made these their refuge whenever they fled from the Spaniards; hereupon, those first conquerors of the New World made use of dogs to range and search the intricatest thickets of woods and forests, for those their implacable and unconquerable enemies; thus they forced them to leave their old refuge, and submit to the sword, seeing no milder usage would do it; hereupon they killed some of them, and, quartering their bodies, placed them in the highways, that others might take warning from such a punishment: but this severity proved of ill consequence; for, instead of frighting them and reducing them to civility, they conceived such horror of the Spaniards, that they resolved to detest and fly their sight for ever: hence the greatest part died in caves and subterraneous places of woods and mountains, in which places I myself have often seen great numbers of human bones. The Spaniards, finding no more Indians to appear about the woods, turned away a great number of dogs they had in their

houses, and they, finding no masters to keep them, betook themselves to the woods and fields to hunt for food to preserve their lives; thus, by degrees, they became unacquainted with houses, and grew wild. This is the truest account I can give of the multitudes of wild dogs in these parts."

This dreadful narrative is abundantly confirmed even by the Spanish historians; who seem, like the bucanier from whom we have quoted this passage, not to have had that natural horror of deeds of cruelty, with which the accounts of them must inspire us who look upon such things without passion or partiality. Columbus was in many respects a good and great man; and yet, when he found, upon his return from Spain to Hispaniola, that the unfortunate people were in revolt against the oppressions of his soldiers, he was determined to put them to death, in the most cruel manner, for that resistance to tyranny which was their natural right and duty. He went forth against the wretched people with his foot-soldiers and cavalry. The historian Herrera adds, "part of the force employed by Columbus on this occasion consisted of twenty bloodhounds, which made great havoc among the naked Indians." Only one of the writers of those times speaks of such cruelties as they deserve; and he was an extraordinary enthusiast, who spent his whole life in the endeavour to mitigate the fury of the conquerors. The name of this benevolent man was Bartholomew las Casas. Relating the events which took place in the island of Cuba, he says, "In three or four months I saw more than seven thousand children die of hunger, whose fathers and mothers had been dragged away to work

in the mines. I was witness, at the same time, of other cruelties not less horrible. It was resolved to march against the Indians who had fled to the mountains. They were chased, like wild beasts, with the assistance of bloodhounds, who had been trained to the thirst for human blood. Other means were employed for their destruction, so that before I had left the island, a little time after, it had become almost entirely a desert." And a desert it has partly remained to this day. The coast, which was most populous at the time when Columbus first touched there, is that which extends westward of the city of Trinidad, along the gulf of Xagua. Mr. Irving, the historian of Columbus, thus describes its present state: "All is now silent and deserted; civilization, which has covered some parts of Cuba with glittering cities, has rendered this a solitude. The whole race of Indians has long since passed away, pining and perishing beneath the domination of the strangers, whom they welcomed so joyfully to their shores." We shudder; and yet this is only a page out of the great book of human history, which records but little else than evils committed upon mankind, under the hateful names of conquest and glory.

We could almost lose our love of dogs in thus learning how they have been trained for the most abominable purposes, did not our indignation more properly attach to those who so trained them. But the history of dogs will at once show us that their sagacity, their quick scent, their courage, and their perseverance, may be equally well trained for good as for evil. It is delightful to turn from the bloodhounds of the conquerors of America to the Alpine

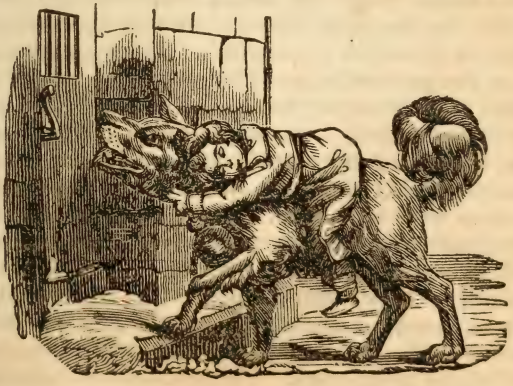
spaniels of the monks of St. Bernard. These wonderful dogs have been usually called mastiffs, probably on account of their great strength; but they strictly belong to the subdivision of spaniels, among which are found the shepherd's dog, the Esquimaux dog, and the other varieties most distinguished for intelligence and fidelity.

The convent of the Great St. Bernard is situated near the top of the mountain known by that name, near one of the most dangerous passages of the Alps, between Switzerland and Savoy. In these regions the traveller is often overtaken by the most severe weather, even after days of cloudless beauty, when glaciers glitter in the sunshine, and the pink flowers of the rhododendron appear as if they were never to be sullied by the tempest. But a storm suddenly comes on; the roads are rendered impassable by drifts of snow: the avalanches, which are huge loosened masses of snow or ice, are swept into the valleys, carrying trees and crags of rocks before them. The hospitable monks, though their revenue is scanty, open their doors to every stranger who presents himself. To be cold, to be weary, to be benighted, constitute the title to their comfortable shelter, their cheerful meal, and their agreeable converse. But their attention to the distressed does not end here. They devote themselves to the dangerous task of searching for those unhappy person who may have been overtaken by the coming storm, and would perish but for their charitable succour. Most remarkably are they assisted in these truly Christian offices. They have a breed of noble dogs in their establishment, whose extraordinary sagacity often enables them

to rescue the traveller from destruction. Benumbed with cold, weary in the search for a lost track, his senses yielding to the stupifying influence of frost, which betrays the exhausted sufferer into a deep sleep, the unhappy man sinks upon the ground, and the snowdrift covers him from human sight. It is then that the keen scent and the exquisite docility of these admirable dogs are called into action. Though the perishing man lie ten or even twenty feet beneath the snow, the delicacy of smell with which they can trace him offers a chance of escape. They scratch away the snow with their feet; they set up a continued hoarse and solemn bark, which brings the monks and labourers of the convent to their assistance. To provide for the chance that the dogs, without human help, may succeed in discovering the unfortunate traveller, one of them has a flask of spirits round his neck, to which the fainting man may apply for support; and another has a cloak to cover him. These wonderful exertions are often successful; and even where they fail of restoring him who has perished, the dogs discover the body, so that it may be secured for the recognition of friends; and such is the effect of the temperature, that the dead features generally preserve their firmness for the space of two years. One of these noble creatures was decorated with a medal, in commemoration of his having saved the lives of twenty-two persons, who, but for his sagacity, must have perished. Many travellers who have crossed the passage of St. Bernard since the peace have seen this dog, and have heard, around the blazing fire of the monks, the story of his extraordinary career. He perished about the

year 1816, in an attempt to convey a poor traveller to his anxious family. The Piedmontese courier arrived at St. Bernard in a very stormy season, labouring to make his way to the little village of St. Pierre, in the valley beneath the mountain, where his wife and children dwelt. It was in vain that the monks attempted to check his resolution to reach his family. They at last gave him two guides, each of whom was accompanied by a dog, of which one was the remarkable creature whose services had been so valuable to mankind. Descending from the convent, they were in an instant overwhelmed by two avalanches; and the same common destruction awaited the family of the poor courier, who were toiling up the mountain in the hope to obtain some news of their expected friend. They all perished.

A story is told of one of these dogs, which, having found a child unhurt whose mother had been



destroyed by an avalanche, induced the poor boy to mount upon his back, and thus carried him to the gate of the convent. The subject is represented in a French print.

In looking back upon the few out of the many varieties of the dog which we have already noticed, we cannot avoid observing the extraordinary modifications of which this quadruped has become susceptible. These modifications are so extensive, and have existed so long, that it is now impossible to decide which is the original breed. Buffon attempted a theory of this nature, but it is evidently unsupported by facts. Almost every country in the world possesses its different kind of dog, and in each of these kinds there are essential differences of character produced by education. The Esquimaux dog draws a sledge, the shepherd's dog guards a flock; the mastiff protects a house, a dog very similar in nature worries a bull; the Spanish bloodhound hunts the naked Indian to the death, while the dog of St. Bernard rescues the perishing man at the risk of his own life. The dog, certainly, has the greatest sympathies with man of all the race of quadrupeds; and the nearer an animal approaches us, and the more easily he comprehends us, the more are we enabled to modify his nature and form his character. What is true of a species is also true of a class. The quadruped is more easily modified—that is, the class is more susceptible of instruction—than the bird, the bird than the insect, the insect than the fish. The difference between intelligence and instinct, the nice partition which divides these qualities, has formed the subject of infinite speculation. The qualities are certainly

not one and the same, as some philosophers have maintained. With regard to the different possession of the qualities, the animal kingdom has been thus divided: 1. Animals endowed with intelligence and instinct, comprising all the *vertebrated division*, since they possess a spino-cerebral nervous apparatus (the seat of intelligence), and a nervous sympathizing or ganglionic system (the seat of instinct); 2. Animals endowed with instinct only, comprising all the *invertebrated division*, since they only possess the ganglionic or sympathizing nervous system among all the species with visible nerves.* Of the vertebrated animals, those which most easily acquire habits from man are quadrupeds; and of quadrupeds, those which are most easily modified are the species which belong to those united in groups, naturally by the social affection. The farther we descend in the scale of existence, the greater is the separation from man; till at last arriving at the vegetable, we find a living substance capable of modification without any effort of its own will; and thus, having only spontaneous inclination for heat, and light, and moisture, undergoing much greater changes from cultivation than animals, however docile. With regard to those animals in the highest scale next to man, the more artificial are their habits, the more are they modified by the circumstances of their domestication. On the contrary, the more natural their habits, the fewer are the deviations from their specific character. The Esquimaux dog and the Dingo differ very slightly from the wolf, which probably is of

* See the article "L'Instinct," in "Nouveau Dictionnaire d'Histoire Naturelle," 2d edit.

the same original family. The petted spaniel could scarcely be recognised as belonging to the species.

The senses of the higher quadrupeds, such as the dog and the horse, are the instruments by which man employs them for his use; and he renders those senses more powerful, in proportion as he cultivates the faculties by which the senses are disciplined. Thus, the senses which are most called into action in the dog are those of smell and hearing. The compensation, if we may so express it, with which Nature balances her gifts, is very remarkable. The chamois, which dwells on the mountains, has a very long sight; the rhinoceros, which inhabits the marshes, sees very keenly for a short distance: the weaker animals, such as rabbits and hares, have the most exquisite sense of hearing; the beasts of prey have piercing eyes, but their ears are dull.* The force of one sense generally compensates for the weakness of another. Thus, dogs have not a very powerful sight (with the exception of the greyhound, which does not smell keenly), but their smell, and generally their hearing, are exquisite. It is the perfection of each of these senses that renders dogs so valuable to man in procuring his food and guarding his property.

Without attempting to explain the peculiar construction of the organ of smell (which would presuppose a knowledge of the meaning of anatomical terms), it may be mentioned, that the nasal organs (the nostrils) are most extensively evolved or unfolded wherever the sense of smell is the most exquisite. Blumenbach states, that in the head of a

* See "Histoire des Mœurs et de l'Instinct des Animaux, par J. J. Virey." Paris, 1822.

North American Indian—a leader of his nation, who was executed at Philadelphia about fifty years ago —the internal nostrils were found of a most extraordinary size. The wonderful acuteness of smell possessed by these savages is recorded in all accounts of their manners. It is well known that the keenest-scented hounds have the largest nostrils.

The comparative quickness of hearing in dogs probably depends, in great measure, on the form of the external ear. Shakspeare has described the matchless hounds of Theseus as dogs whose

"Heads are hung
With ears that sweep away the morning dew."

This was one of the characteristics of the *old* English hound, whose hearing was very perfect, and whose sense of smell, also, was the most exquisite that can be imagined. M. Cabanis says, the ears of hounds, and other animals designed to hear *low* sounds (low, as opposed to loud), are either pendulous or very moveable, to compensate for their difficulty in moving the head.

We have mentioned that these exquisite senses are increased and called into action by discipline. The fox-hound will distinguish the scent of the fox he is pursuing from that of another fox who crosses his path; the spaniel and terrier will track their masters, by their scent, through a crowded city; the watch-dog barks when no one else hears a footfall. Why is this? These dogs have been accustomed, partly by nature and partly by education, to regulate their senses by the exercise of attention; to condense their faculties for the service in which they are engaged; to direct their capabilities to the one object

which is necessary to be attained. They are generally successful; and their success offers a valuable example to our higher faculties.

Dogs are excellent judges of distance: they seldom fail in attempting to leap a ditch or a gate. We have seen a greyhound, in full chase of a hare which ran through a ditch, throw himself over the hedge to be ready for her as she passed out; and the manœuvre rarely failed of success. This must be considered an effect of reasoning, at any rate; although we may not go quite so far as Ray, the great English naturalist, who says that dogs judge of distances by an innate operation of trigonometry. Dr. Thomas Brown, one of the most beautiful, as well as profound writers on Intellectual Philosophy, considers the existence of reasoning among many of the inferior animals to be as unquestionable as the instincts that mingle with it. Montaigne, the most accurate of observers, has recorded a singular instance of their faculty of judging of space: "I am struck with admiration at the performance, which is nevertheless very common, of those dogs that lead blind beggars in the country and in cities. I have taken notice how they have stopped at certain doors where they are wont to receive alms; how they have avoided the encounter of coaches and carts, even in cases where they have had sufficient room to pass; and I have seen them, by the trench of a walled town, forsake a plain and even path to take a worse, only to keep their masters farther from the ditch. How could a man have made this dog understand that it was his office to look to his master's safety only, and despise his own convenience to serve him? And how did he acquire the

knowledge, except by a process of reasoning, when the path was broad enough for himself, that it was not so for the blind man?"* How could a man have made this dog understand? Here is the real difficulty. Habit certainly does a great deal; but then there must be a beginning of such experiments.

In a work by Jean Faber (*Exposition des Animaux de la Nouvelle Espagne de Hernandez*) there is a very interesting account of the blind beggars of Rome, who were led by their dogs from church to church in that city, and even to places outside of the city walls, such as the Basilica of St. Paul, on the road to Ostia. How does the animal so thoroughly comprehend where his master wishes to go? Dr. Gall says that dogs "learn to understand not merely separate words or articulate sounds, but whole sentences expressing many ideas." Dr. Elliotson, the learned translator of Blumenbach's Physiology, quotes the following passage from Gall's Treatise on the Functions of the Brain, without expressing any doubt of the circumstance: "I have often spoken intentionally of objects which might interest my dog, taking care not to mention his name, or make any intonation or gesture which might awaken his attention. He, however, showed no less pleasure or sorrow, as it might be; and, indeed, manifested by his behaviour that he had perfectly understood the conversation which concerned him. I had taken a bitch from Vienna to Paris; in a very short time she comprehended French as well as German, of which I satisfied myself by repeating before her whole sentences in

* Montaigne's Essays, translated by Cotton.

both languages." We have heard an instance of this quickness in the comprehension of language which is very remarkable. A mongrel, between the shepherd's dog and terrier, a great favourite in a farmhouse, was standing by while his mistress was washing some of her children. Upon asking a boy whom she had just dressed to bring his sister's clothes from the next room, he pouted and hesitated. "Oh, then," said the mother, "Mungo will fetch them." She said this by way of reproach to the boy, for Mungo had not been accustomed to fetch and carry. But Mungo was intelligent and obedient; and, without farther command, he brought the child's frock to his astonished mistress. This was an effort of imagination in Mungo, which dogs certainly possess in a considerable degree. He had often observed, doubtless, the business of dressing the children; and the instant he was appealed to, he imagined what his mistress wanted. Every one knows the anxiety which dogs feel to go out with their masters, if they have been accustomed so to do. A dog will often anticipate the journey of his owner; and, guessing the road he means to take, steal away to a considerable distance on that road to avoid being detained at home. We have repeatedly seen this circumstance. It is distinctly an effort of the imagination, if, indeed, it be not an inference of reasoning.

The shying of horses has been considered by some as a peculiar defect of sight; at any rate, it is an effect of some false terror. Dogs fill their imagination with vain fears in the same manner. We have been informed by an intelligent sportsman, that, returning home in the dusk with his

pointer, the dog all at once skulked behind him, and refused to advance, in spite of his master's threats. Upon looking towards the horizon before him, the sportsman descried what he at first took for a tall man, with a broad hat, extended arms, and a body as thin as a lath. This object, which produced the dog's alarm, was a gigantic thistle, which the gray of the twilight had magnified into fearful dimensions. The credulous once believed that dogs and horses could see spirits, by their often starting without any apparent cause. Such instances as this of the thistle might have given rise to the superstition.

Linnæus has made it a characteristic of dogs that "they bark at beggars:" but beggars are ragged, and sometimes have that look of wildness which squalid poverty produces; and then the imagination of the dog sees, in the poor mendicant, a robber of his master's house, or one who will be cruel to himself; and he expresses his own fears by a bark. A dog is thus valuable for watching property, in proportion to the ease with which he is alarmed. One of the greatest terrors of a domesticated dog is a naked man, because this is an unaccustomed object. The sense of fear is said to be so great in this situation, that the fiercest dog will not even bark. A tanyard at Kilmarnock, in Ayrshire, was a few years ago extensively robbed by a thief, who took this method to overcome the courage of a powerful Newfoundland dog, who had long protected a considerable property. The terror which the dog felt at the naked thief was altogether imaginary; for the naked man was less capable of resisting the attack of the dog than if he had been

clothed. But then the dog had no support in his experience. His memory of the past did not come to the aid of that faculty which saw an unknown danger in the future.

The faculties of quadrupeds, like those of men, are, of course, mixed in their operation. The dog, who watches by his master's grave, and is not tempted away by the caresses of the living, employs both his memory and his imagination in this act of affection. In the year 1827, there was a dog constantly to be seen in St. Bride's Churchyard, Fleet-street, which for two years had refused to leave the place where his master was buried. He did not appear miserable; he evidently recollected their old companionship, and he imagined that their friendship would again be renewed. The inhabitants of the houses around the church daily fed the poor creature, and the sexton built him a little kennel. But he never would quit the spot; and there he died.

The instances of devoted affection of dogs to their masters are too numerous and too well known to require that they should be here repeated. It is a fortunate circumstance connected with this natural attachment of dogs to mankind, that in general they are only considered valuable during their lives; and their value consists in the qualities which have a tendency to make men gentle and affectionate towards them in return. But this reciprocal friendship is not universal. The natives on the coast of Guinea and those of the South Sea Islands eat dog's flesh; they are said to be dog-butchers in China; and in Finmark, and in other parts of Lapland, dogs are bred, fattened, and slaughtered for their hides.

The faculty by which animals can communicate their ideas to each other is very striking; in dogs it is particularly remarkable. There are many curious anecdotes recorded illustrative of this faculty.

The following story, which illustrates in a singular manner the communication of ideas between dogs, was told by a clergyman as an authentic anecdote: A surgeon of Leeds, walking in the suburbs of that town, found a little spaniel who had been lamed. He carried the poor animal home, bandaged up his leg, and, after two or three days, turned him out. The dog returned to the surgeon's house every morning till his leg was perfectly well. At the end of several months the spaniel again presented himself, in company with another dog, which had also been lamed; and he intimated, as well as piteous and intelligent looks could intimate, that he desired the same kind assistance to be rendered to his friend as had been bestowed upon himself. A similar circumstance is stated to have occurred to Moraut, a celebrated French surgeon.

What is generally called the docility of dogs—the faculty of being taught tricks contrary to their natures, is curious, but far from pleasing: the perfection is generally attained by cruelty. It is more agreeable to witness a natural docility; such as that of the shepherd's dog, who learns to distinguish every sheep of a large flock; and who will drive them through the crowded streets with a foresight perfectly wonderful. Some of the finest dogs in the world are those which watch the Merino sheep upon the Spanish mountains. They wear large collars with spikes, to protect them from the at-

tacks of the wolves; and they conduct their flocks with a gentleness which is only equalled by their courage. When they return to the folds, the dogs bring up the stragglers without violence; and the man walks at their head in the true pastoral style so beautifully described in the Psalms: "The Lord is my shepherd; I shall not want. He maketh me lie down in green pastures; he *leadeth* me beside the still waters."

The dog, as well as most other animals, indicates his different feelings by different tones of his voice; and thus the shepherd's dog has a command over his flock without using positive violence. Their tones are so marked that they are recognised as expressive of anger or fear by other animals. The horse knows from the bark of a dog when he may expect an attack upon his heels.

The practice of teaching dogs tricks is as old as the Romans. Montaigne has quoted from Plutarch the following account of a *wonderful* dog of antiquity: "Plutarch says he saw a dog at Rome, at the theatre of Marcellus, which performed most extraordinary feats, taking his part in a farce which was played before the Emperor Vespasian. Among other things, he counterfeited himself dead, after having feigned to eat a certain drug, by swallowing a piece of bread. At first he began to tremble and stagger, as if he were astonished; and at length, stretching himself out stiff as if he had been dead, he suffered himself to be drawn and dragged from place to place, as it was his part to do; but afterward, when he knew it to be time, he began first gently to stir, as if newly awaked out of some profound sleep, and, lifting up his head,

looked about him after such a manner as astonished all the spectators."

We have alluded to those exhibitions of remarka ble attachment between animals of opposite natures, which are sometimes so interesting in menageries. These attachments are more frequent with dogs than with other animals, probably because they are more capable of attachment. The friendship between dogs and horses is too common to attract notice; but every now and then we hear of an attachment where we might have expected an antipathy. Dr. Fleming, in his interesting book, "The Philosophy of Zoology," quotes from Montague's supplement to his Ornithological Dictionary the following account of a singular friendship which subsisted between a China goose and a pointer which had killed the gander. "Ponto (for that was the dog's name) was most severely punished for the misdemeanour, and had the dead bird tied to his neck. The solitary goose became extremely distressed for the loss of her partner and only companion; and, probably, having been attracted to the dog's kennel by the sight of her dead mate, she seemed determined to persecute Ponto by her constant attendance and continual vociferations; but, after a little time, a strict amity and friendship subsisted between these incongruous animals. They fed out of the same trough, lived under the same roof, and in the same straw bed kept each other warm; and when the dog was taken to the field, the inharmonious lamentations of the goose for the absence of her friend were incessant."

The stories of attachment between lions and dogs are well authenticated; and in several instances

the stronger animal has afforded a protection to his trembling victim which has ripened into friendship. In a well-regulated travelling menagerie belonging to a person named Atkins, we saw, in the autumn of 1828, a spaniel-bitch affording sustenance to a young tiger who was sick and not expected to live, and whom she evidently tended with affectionate solicitude. The following cut is a representation of this singular pair.

We cannot quit the subject of dogs without adverting to that lamentable circumstance, their occasional madness. This disease is not common to dogs in all climates. According to Mr. Barrow, canine madness is unknown in South Africa, although this assertion has been disproved within

these few years.* Other temporary diseases are oftentimes mistaken for this fearful malady; and we therefore subjoin the symptoms of hydrophobia, as described by MM. Chaussier and Orfila, who have written a scientific work on this disorder:

"A dog at the commencement of madness is sick, languishing, and more dull than usual. He seeks obscurity, remains in a corner, does not bark, but growls continually at strangers, and, without any apparent cause, refuses to eat or drink. His gait is unsteady, nearly resembling that of a man almost asleep. At the end of three or four days he abandons his dwelling, roving continually in every direction: he walks or runs as if tipsy, and frequently falls. His hair is bristled up; his eyes haggard, fixed, and sparkling; his head hangs down; his mouth is open and full of frothy slaver; his tongue hangs out; and his tail between his legs. He has for the most part, but *not always*, a horror of water, the sight of which seems generally to redouble his sufferings. He experiences from time to time transports of fury, and endeavours to bite every object which presents itself, not even excepting his master, whom, indeed, he begins not to recognise. Light and lively colours greatly increase his rage. At the end of thirty or thirty-six hours he dies of convulsions." It has also been stated as additional symptoms of canine madness, that the animal, if bitten, is at first incessantly employed in scratching or gnawing the wound; that the eye becomes bloodshotten, accompanied with a slight squinting; that sometimes a depraved appetite exists, shavings,

* A case of hydrophobia is recorded by Dr. Wentworth in the Cape Town Gazette.

straw, thread, hair, &c., having been found in the stomach on dissection; and also that in the dog there is no *dread* of water, as he frequently endeavours to drink, but is unable to swallow in consequence of a paralysis of the muscles of the throat.

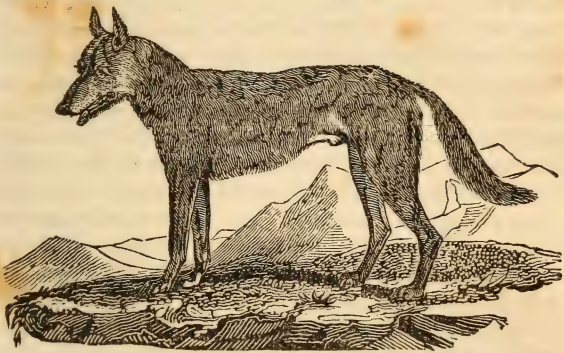
The disorder, however, is yet but very imperfectly understood, and there are many conflicting opinions on the subject. To observe and record facts is the surest mode of increasing our knowledge of the subject, and may, perhaps, eventually lead to the discovery of an antidote or a preventive of this terrible malady. At present, after various remedies have been tried in vain, it seems agreed that cutting or burning out the bitten part is the only one to be relied on.

The domestic dog is scientifically distinguished from the other varieties of the species Canis by having its tail curved upward. Whenever there is white on any part of the tail of the domestic dog, the *tip* is invariably white.

The dog, whelped with his eyes closed, opens them on the tenth or twelfth day. His teeth begin to change in the fourth month. His growth terminates at two years, and he is old at five. His life rarely exceeds twenty years. The female goes with young sixty-three days.

CHAPTER IV.

THE WOLF, THE JACKAL, AND THE FOX.



The Wolf, PENNANT *Canis Lupus,* LINNÆUS.

IN the garden of the Zoological Society there are three young wolves, a pair of which came from Normandy. The height of the specimen from which the above representation was taken was twenty-six inches in September, 1828. These animals are here confined in a manner which enables the observer to judge better of their habits than in the ordinary dens of the menageries. They have a roomy kennel to feed and sleep in; and a sort of outer cage, made of strong bars of iron rising from the ground, and forming an arch, sufficiently large to enable them to chase each other about with con-

siderable freedom: their play is, however, extremely rough, and they often bite with great violence. Upon the whole, they appear good-tempered. We observed a gentleman somewhat imprudently thrust his hand into the cage, upon which they all licked it, fawning like dogs.

The essential character of the common wolf consists in a straight tail; the hide of a grayish yellow, with a black oblique stripe on the fore-legs of those which are full grown; the eyes oblique. The average height of the wolf is about two feet six inches before, and two feet four inches behind; and the length of the body, from the tip of the muzzle to the beginning of the tail, three feet eight inches. The cubs of the wolf are born with their eyes shut; the female goes with young sixty-three days, and has eight or nine at a litter, in these respects exactly resembling the dog.* The average duration of their life is from fifteen to twenty years.

The gentleness of wolves in confinement seldom continues after they are full grown; they generally appear to acquire a fear instead of a love of man, which manifests itself in a morose and vindictive impatience. The cowardly ferocity of their natures is with difficulty restrained by discipline; they are not to be trusted. And yet there are instances of wolves having been domesticated to such an extent as to exhibit the greatest attachment to man; as great as can be shown by a dog. M. F. Cuvier gives a very interesting account of a tame wolf, which had all the obedience towards, and affection

* The period of gestation in the wolf is inaccurately stated in Goldsmith's "Animated Nature;" and from the *supposed* difference in this particular between the dog and the wolf, an inference is drawn that they are essentially a different species.

for, his master that the most sagacious and gentle of domestic dogs could possibly evince. He was brought up in the same manner as a puppy, and continued with his original owner till he was full grown. He was then presented to the menagerie at Paris. For many weeks he was quite disconsolate at the separation from his master, who had been obliged to travel; he would scarcely take any food, and was indifferent to his keepers. At length he became attached to those about him, and he seemed to have forgotten his old affections. His master returned after an absence of eighteen months; the wolf heard his voice amid the crowd in the gardens of the menagerie, and, being set at liberty, displayed the most violent joy. Again was he separated from his friend, and again was his grief as extreme as on the first occasion. After three years' absence, his master once more returned. It was evening, and the wolf's den was shut up from any external observation; yet the instant the man's voice was heard, the faithful animal set up the most anxious cries; and the door of his cage being opened, he rushed towards his friend, leaped upon his shoulders, licked his face, and threatened to bite his keepers when they attempted to separate them. When the man left him, he fell sick, and refused all food; and from the time of his recovery, which was long very doubtful, it was always dangerous for a stranger to approach him. He appeared as if he scorned any new friendships.

This is a very remarkable, and, as far as we know, a solitary instance of the wolf possessing the generous, constant, unshaken attachment of the dog to any individual of the human species. And yet

the paucity of these instances may be attributed to our imperfect knowledge of the history of the domestication of the dog tribe. In the individual animal described by M. F. Cuvier, the progress was very clear from a state of savage fierceness to a state of docility and extraordinary sensibility. This wolf was taken young; brought up with human beings; cherished by one in particular; never suffered to have his ferocity excited by a want of food; and supplied with every necessary, as well as caressed, by the person with whom he had especially become familiar. It is very rarely that such an experiment can be tried; for the inhabitants of Europe, for the last thousand years at least, have been labouring with unceasing anxiety to extirpate the whole race of wolves. The Esquimaux dogs, which we have described, are probably wolves in a state of domestication; but neither the date of their domestication, nor the manner in which it has been effected, could be satisfactorily determined, even if the fact of the identity of the species were completely established. That there is an essential difference in the characters, though little or none in the physical structures of wolves, properly so called, and of dogs in the wildest state (that is, in the state in which they most nearly resemble wolves), is beyond a doubt. They are natural foes: the Esquimaux dogs set up a fearful howl at the approach of a wolf to their huts; and yet, in their outward appearance, these animals are exceedingly alike. Captain Parry, in the Journal of his Second Voyage, says, "a flock of thirteen wolves, the first yet seen, crossed the ice in the bay from the direction of the huts, and passed near

the ships. These animals, as we afterward learned had accompanied, or closely followed the Esquimaux on their journey to the island the preceding day; and they proved to us the most troublesome part of their suite. They so much resemble the Esquimaux dogs, that, had it not been for some doubt among the officers who had seen them whether they were so or not, and the consequent fear of doing these poor people an irreparable injury, we might have killed most of them the same evening, for they came boldly to look for food within a few yards of the *Fury*, and remained there for some time." Again he says in his journal five days after, "these animals were so hungry and fearless as *to take away some of the Esquimaux dogs* in a snow house near the *Hecla's* stern, though the men were at the time within a few yards of them." Thus we see that there is an essential difference of character between the Esquimaux dog and wolf, which has rendered the one the natural enemy of the other, although their physical resemblance be so close as to present no essential variation to an ordinary observer. This difference of character is probably to be found, in a great degree, in the effect of hereditary habit. We have other instances of the disposition which wolves have to make the dog their prey. Captain Parry, in a subsequent passage of the same journal, mentions that a Newfoundland dog, belonging to one of the discovery ships, being enticed to play with some wolves who were prowling upon the ice, would have been carried off by them had not the sailors gone in a body to his rescue. In Broke's Travels we find the following curious circumstances re-

corded as happening in the north of Sweden: "I observed, on setting out from Sormjöle, the last post, that the peasant who drove my sledge was armed with a cutlass; and, on inquiring the reason, was told that the day preceding, while he was passing in his sledge the part of the forest we were then in, he had encountered a wolf, which was so daring that it actually sprung over the hinder part of the sledge he was driving, and attempted to carry off a small dog which was sitting behind him. During my journey from Tornea to Stockholm, I heard everywhere of the ravages committed by wolves, not upon the human species or the cattle, but chiefly upon the peasants' dogs, considerable numbers of which had been devoured. I was told that these were the favourite prey of this animal; and that, in order to seize upon them with the greater ease, it puts itself into a crouching posture, and begins to play several antic tricks to attract the attention of the poor dog, which, caught by these seeming demonstrations of friendship, and fancying it to be one of his own species from the similarity, advances towards it to join in the gambols, and is carried off by its treacherous enemy. Several peasants that I conversed with mentioned their having been eyewitnesses of this circumstance." Nor is the animosity of the dog to the wolf less than that of the wolf to the dog. Associated in packs and encouraged by men, dogs will chase the wolf with the most daring ardour, regardless of his greater physical strength; and, probably, without the aid of dogs, they would never have been exterminated.

The wolf is peculiarly an inhabitant of Europe, and he still continues so in the more northern re-

gions, and in those countries where dense forests are not yet cleared. They once abounded in England; and it is manifest that the terror which they produced was not a rare circumstance, but spread itself throughout all the land, and became a part of the habitual thoughts of the people. The month which corresponds with our January was, at one period, called, by the Anglo-Saxons "Wolf-monat;" and the reason for this is thus explained by an old writer on British antiquities. "The moneth which we now call January they called 'Wolf monat,' to wit, Wolf moneth, because people are wont always in that moneth to be more in danger to be devoured of wolves, than in any season els of the yeare; for that, through the extremity of cold and snow, those ravenous creatures could not find of other beasts sufficient to feed upon."* The natural terror which the wolves inspired among the scattered inhabitants of the half-cultivated lands of England was increased by their habitual superstitions. The same author, in his chapter "on the Antiquitie and Proprietie of the ancient English tongue," says, "*Were-wulf:* this name remaineth still known in the Teutonic, and is as much to say as man-wolf, the Greek expressing the very like in Lycanthropos. The *were-wolves* are certain sorcerers, who, having anointed their bodies with an ointment which they make by the instinct of the devil, and putting on a certain enchanted girdel, do not only unto the view of others seem as wolves, but to their own thinking have both the shape and

* Verstegan's "Restitution of decayed Intelligence in Antiquities concerning the most noble and renowned English nation." Antwerp, 1605.

nature of wolves, so long as they weare the said girdel; and they do dispose themselves as very wolves in wurrying and killing, and waste of human creatures." The Germans had a similar superstition; and as late as 1589, a man was executed in the Netherlands under the charge of being a were-wulf. This pretended sorcerer, assuming one of the most formidable shapes of mischief, was called, in France, *loup-garou*. It is said that the wolf, when it has once tasted human flesh, gives it the preference over all other animal food; and from this cause it probably arose that, for many centuries of ignorance, when the influence of evil spirits was universally believed, and the powers of witchcraft was not doubted even by the learned, a raging wolf, devouring everything in his way—the sheep in its fold and the child in its cottage bed, and even digging up newly-buried bodies from their graves—should be supposed to be possessed with some demon more fearful than its own insatiate appetites. It is to the terror, also, which the wolf inspired, that we are to ascribe the fact of kings and rulers, in a barbarous age, feeling proud of bearing the name of this animal as an attribute of courage and ferocity. Brute power was then considered the highest distinction of man; and the sentiment was not mitigated by those refinements of modern life which conceal, but do not destroy it. We thus find among the Anglo-Saxon kings and great men, Æthelwulf, the noble wolf; Berthwulf, the illustrious wolf; Eadwulf, the prosperous wolf; Ealdwulf, the old wolf.

In the southern and temperate countries of Europe wolves are now rarely found. In severe win-

ters they sometimes make their appearance in France and Germany. In Spain, the dogs who watch the flocks wear spiked collars, as we have before mentioned, to protect them from the occasional incursions of the enemy. We must refer to the accounts of travellers in the northern parts of Europe and of America for any notice of the appearance of these animals in considerable numbers. Wolves are, in those northern regions, very formidable creatures, sometimes measuring six feet from the muzzle to the end of the tail.*

Their prevailing colour is light, with a silvery black stripe extending from the upper part of the neck along the back. Mr. Sabine considers it probable, that the loss of colour in the white wolves, in the vicinity of the Arctic Seas, is occasioned by the severity of the winter seasons; though the change does not occur in all cases. Desmarest, though he admits this change, notices the white wolf as a variety belonging to the description of animals called *Albinoes*.

The peculiar whiteness of the hair or feathers to which albinoes are subject, and which occurs not only in quadrupeds and birds, but in the human race, is occasioned by a defect in the colouring matter of these coverings of the skin, and is always connected with a defect in sight, which arises from the deficiency in the eye of what is called the mucous pigment. Blumenbach thinks that this deficiency is hereditary in some of the mammalia, so as to form a constant breed of white animals, as in the rabbit, mouse, and horse; and that, in the same way, the ferret, whose white skin and red *glassy* eyes are well known, is descended from the

* Broke's Travels.

polecat.* The subject of albinoes is intimately connected with some curious facts which have been recently investigated; and which completely prove the intimate connexion between, or, rather, identity of, that substance which gives colour to the skin and hair, and that which regulates the ability of the animal to endure a greater or less degree of light.

From a series of experiments instituted to ascertain the power of the sun's rays, it has been established by Sir Everard Home, that although the absolute heat, in consequence of the absorption of the rays, is greater from a black surface, yet the power of the rays to scorch the skin is thus destroyed; according to Sir Humphrey Davy, by being converted into sensible heat by the absorption. It is thus that the negro has a provision for the defence of his skin while living within the tropics; and in the same manner, his eye, which is exposed to strong light, has the mucous pigment darker than that of the European.† In all quadrupeds which look upward, as the monkey; in birds exposed to the sun's rays; and in fishes which lie upon the surface of the ocean, this pigment is dark. In ruminating animals, which look downward, and in nocturnal animals, such as the cat, it is light; in the owl, it is entirely absent. In the Supplement recently published to his Lectures on Comparative Anatomy, Sir Everard Home has collected some farther facts on this interesting subject. He says that the "*rete mucosum*," a kind of pigment which lines the cuticle upon the surface of the body, and constitutes the tubular cavity that forms hair, is precise-

* Blumenbach's Comparative Anatomy, translated by Lawrence and Coulson.

† Home's Lectures on Comparative Anatomy vol iii.

ly the same substance as that upon which the retina of the eye is spread (which we have called the mucous pigment); and thus, being acted upon by the same circumstances, when the hair becomes gray, the person can only see with a weak light. Baron Larrey mentioned to Sir Everard Home the case of a man who had been confined at Brest thirty-three years in a subterraneous prison. During the day, he was completely blind, and only saw objects in the dark. His hair was absolutely blanched; and when it first became white, the pigment of his eyes had undergone the same change. With regard to the subject which led us to these curious facts—the white animals of the most northern climates—Sir Everard Home unhesitatingly says, that the shedding of the hair and feathers in the Arctic regions, during the six months in which they are not visited by the sun, *is accompanied by the absence of the "nigrum pigmentum"* (the black pigment), by which the animals and birds are fitted to see with the weak light afforded them.* With these facts before us, it may reasonably be believed that many of the white animals of the Arctic regions are, during a portion of the year, when the cold is intense and the days are dark, what are called Albinoes; that is, that with the change of the colour of their hair, the mucous pigment of the eye also changes colour; or, in other words, that the black pigment is absent when the hair periodically becomes white. We have already seen how this whiteness of the fur enables the animal to bear the diminished temperature, without such a diminution of the warmth of his body as would deprive him

* Supplement to Lectures, vol. v., p. 282, 1828.

of his physical powers; and upon the same beautiful principle of arrangement by an all-wise Providence, which so nicely adjusts the senses and faculties of animals to the situations in which they are placed, the deficiency of the black pigment of the eye enables some quadrupeds to see distinctly in the faint light of the long Arctic winter. Upon this principle, M. Desmarest's description of the white wolf, "an animal affected with the albino disease," is an incorrect one. He is an animal the colour of whose fur, as well as the pigment of whose eye, undergoes a change to fit him for the very extraordinary changes of heat and light he is exposed to; and which change of the fur and the eye prevents him utterly perishing during that incapacity to procure his food which extreme cold and darkness would otherwise bring upon him. It is remarkable, that these extraordinary adaptations of the body to climate are confined to the inferior animals. Man is not affected by them to anything like the same extent; for the colour of the negro's skin is unvarying in certain latitudes, and the albinoes of the human race are so from the effect of disease. We may conclude, from this circumstance, that man, in the cases of adaptation to climate, as in all other cases, is left to derive his protection against physical evils from the exercise of his own reason. The poor Esquimaux, during their intense winters, clothe themselves with thick furs, shut themselves up in a snow hut (the warmest of coverings from the external air), make fires, and obtain light from oil. Man, therefore, has a defence, in his superior intelligence, against the rigours of climate, even in the most exposed situ-

ations. He is left to the unaided care of this intelligence, without that special intervention of Providence, which makes such arrangements for the preservation of the inferior animals as shall come to the aid of their instinct, and stand in the place of those comforts which may be obtained by the higher faculties of the human race. Man, for instance, is the only animal that can produce artificial light and heat. He makes a fire in the woods, and the monkeys will warm themselves at it; but no monkey ever yet succeeded in kindling a fire himself. As man advances in civilization, these broad distinctions may be overlooked in the elaborate contrivances by which he heaps up every comfort and luxury around him; by manufactures and commerce ensuring the possession of them, in various degrees, to all the human race. But the ability to construct a steam-engine, and the knowledge which shows how to kindle the fuel which sets that machine in motion, are equally results of the superior intellect of man, as distinguished from the faculties of the creatures beneath him. "Consider the lilies of the field how they grow; they toil not, neither do they spin." The lilies of the field derive their exceeding beauty, without an effort, from the hand of the God of Nature; but the same God ordains the toiling and spinning for man, to enable him to preserve that place in the creation to which he is destined—the head of all beings which inhabit this earth—by the constant and progressive exercise of his reasoning faculties, and by the employment of that knowledge which, from the accumulated experience of past generations, constitutes the power of civilization.

In the southern states of America, according to Mr. Warden, the Black Wolf is found. A black wolf was taken in the Missouri territory by a party engaged in Major Long's expedition from Pittsburg to the Rocky Mountains; and Mr. Say, who accompanied that expedition, has described it under the name of *Canis nubilis*, or *Clouded Wolf*. In the Menagerie of the Tower of London there is at present a pair of wolves, taken in America, and presented by the Hudson's Bay Company, whose hair is of that mottled or clouded colour, formed of various shades of black, gray, or white, which determined Mr. Say in his choice of a name for the variety.

The Clouded Wolf. Canis nubilus, SAY.

These animals are larger and stronger than the common wolf; of a fierce aspect, but, in a considerable degree, without that peculiar expression—that sinister look of apprehension, united with ferocity—which usually characterizes the wolf species. Their tail is shorter than that of the common wolf, and their ears are remarkably short. These individual animals are extremely voracious; and their natural fierceness has not been in the slightest degree changed by confinement. The head of the American wolf, generally, is larger than that of the European; the muzzle is rounder; and his expression has less of that character which is expressed by the common word *slinking*.

Of the habits of the wolves of America, in which part of the world there are several varieties, we have now very accurate descriptions by intelligent and daring travellers. From those narratives we may form some tolerable idea of the pest which formerly existed in Enganld, before their extirpation. During the arduous journeys of Captain Franklin to the shores of the Polar Sea, he and his companions were often obliged to dispute their scanty food with the prowling wolves of those inclement regions. On one occasion, when they had captured a moose-deer and had buried a part of the body, the wolves absolutely dug it out from their very feet, and devoured it, while the weary men were sleeping. On another occasion, when the travellers had killed a deer, they saw, by the flashes of the Aurora Borealis, eight wolves waiting around for their share of the prey; and the intense howling of the ferocious animals, and the cracking of the ice by which they were surrounded, prevented them

from sleeping even if they had dared. But the wolves were sometimes caterers for the hungry wanderers in these dreary regions. When a group of wolves and a flight of crows were discovered, the travellers knew that there was a carcass to be divided; and they sometimes succeeded in obtaining a share of the prey, if it had been recently killed. Even the wolves have a fear of man; and they would fly before the little band without attempting resistance. The following anecdote is full of interest: "Dr. Richardson, having the first watch, had gone to the summit of the hill, and remained seated, contemplating the river that washed the precipice under his feet, long after dusk had hidden distant objects from his view. His thoughts were, perhaps, far distant from the surrounding scenery, when he was roused by an indistinct noise behind him; and, on looking round, perceived that nine white wolves had ranged themselves in form of a crescent, and were advancing, apparently with the intention of driving him into the river. On his rising up, they halted; and when he advanced, they made way for his passage down to the tents." This circumstance happened when the weather was sultry. The formation of a crescent is the mode generally adopted by a pack of wolves to prevent the escape of any animal which they chase.

The following passage, from the same interesting work, shows the extreme cunning of the wolves in the pursuit of a creature of superior speed: "So much snow had fallen on the night of the 24th, that the track we intended to follow was completely covered; and our march to-day was very fatiguing. We passed the remains of two red deer, lying at the

bases of perpendicular cliffs, from the summits of which they had probably been forced by the wolves. These voracious animals, who are inferior in speed to the moose or red deer, are said frequently to have recourse to this expedient in places where extensive plains are bounded by precipitous cliffs. While the deer are quietly grazing, the wolves assemble in great numbers; and forming a crescent, creep slowly towards the herd, so as not to alarm them much at first; but when they perceive that they have fairly hemmed in the unsuspecting creatures, and cut off their retreat across the plain, they move more quickly, and with hideous yells terrify their prey, and urge them to flight by the only open way, which is towards the precipice; appearing to know that, when the herd is once at full speed, it is easily driven over the cliff; the rearmost urging on those that are before. The wolves then descend at their leisure, and feast on the mangled carcasses."

Ferocious as the wolf of all countries is in the chase of weaker animals, he is ever extremely apprehensive for his own safety. In North America, a bladder hung upon a pole, and blown about by the wind, will deter him from molesting the numerous herds of buffaloes. He is in continual dread of being entrapped to his destruction. He will always attack a reindeer when loose; but if the animal is tied to a stake, he fears to approach, considering that a pitfall is near, and that the deer is placed there to entice him to it. The Esquimaux, however, often take him in a trap made of ice, at one end of which is a door of the same abundant material, fitted to slide up and down in a groove; to the upper part of this door a line is attached, and,

passing over the roof, is let down into the trap at the inner end, and there held by a peg of ice in the ground. Over the peg the bait is fastened; and the whole machinery is concealed by a false roof. Of course, when the bait is removed, the line slips off the peg, and the door comes down. This contrivance is quite in character with the surrounding scenery; and thus the wolf is deceived, in spite of his habitual caution. Two were taken at Winter Island in this manner, at the time of Captain Parry's second voyage. The Indians in the neighbourhood of Lake Winnipic, which is the reservoir of several large rivers, and discharges itself by the River Nelson into Hudson's Bay, were, till a very recent period, principally employed in trapping wolves. They were accustomed to make tallow from their fat, and prepare their skins to exchange with the traders from Montreal. The dealers in fur, associated into a company in Canada, exported to England in one year (1798) wolf-skins to the number of three thousand eight hundred. As civilization has advanced in these provinces, the Indians, and the beasts of the forests and rivers, have been driven farther and farther into the wilds onward to the coldest regions. But the trade in furs of North America is still very considerable, and is now principally in the hands of the Hudson's Bay Company. Some idea of the destruction of animal life, to provide for the comforts and luxuries of Europeans, may be formed from the statement which we gather in Captain Franklin's Narrative of his Journey: that, in 1822, the Hudson's Bay Company imported 3000 skins of the black bear, 60,000 of the pine marten, 1800 of the fisher (a species of sable), 4600

of the mink, 7300 of the otter, 8000 of the fox, 9000 of the Canadian lynx, 60,000 of the beaver, 150,000 of the musk rat; besides smaller numbers of the skins of wolves, wolverines, badgers, and racoons.

Amid this constant warfare of mankind against the wolf, it is not surprising that the character of the species should be that of ferocity, cunning, and suspicion; that they should be with difficulty tamed; and that the human race should be to them the object of dread and of aversion. It is probably owing to the influence of the same hereditary fear, that both the male and female wolf are most remarkably solicitous for the protection and defence of their young. The female prepares a nest, or she burrows (as is the case with most of the American varieties) in almost inaccessible situations: she lines this retreat with moss and with her own hair. She suckles her cubs for two months, during which the he-wolf supplies her with food. When they begin to eat, they are fed with half-digested meat, which the parents themselves disgorge; and till the cubs are sufficiently grown to protect themselves—that is, till they are six or eight months old—the parents invariably watch over their safety. The female fox is distinguished in the same manner for the care of her young. It is to this strong affection for her offspring, increasing doubtless with the necessity for protection, that the race of wolves has not long ago become extirpated, at least in Europe. Were the young left without the aid of this extraordinary parental care, they would have little chance of escape from the indefatigable hostility of man. A distinguished writer and naturalist of the last age

says, "There are no animals destitute of some means to preserve themselves and their kind; and these means so effectual, that notwithstanding all the endeavours and contrivances of man and beast to destroy them, there is not to this day one species lost of such as are mentioned in history."* This must be taken with a limitation to the *recent* races of animals, those "mentioned in history;" for the researches of naturalists have discovered fossile remains of animals differing from any which we at present know. And yet it is by no means certain that some of these animals do not even now exist, although we are unacquainted with them.† The kangaroo, and the ornithorhynchus, two of the most extraordinary creatures of Australasia with which we are now familiar, were unknown to Europeans half a century ago. Large tracts of Africa are yet unexplored; and it is possible that the future enterprise of such travellers as those who have already penetrated some distance into those regions, may be successful in discovering either the abodes of civilization, or, what is more probable, new varieties of animal life unsubdued by man, and essentially differing from those of which the human race has already made a conquest.

The female wolf goes with young sixty-three days, producing from five to nine whelps at a litter, whose eyes are not opened till about the twelfth day, like the whelps of the dog. The average duration of the wolf's life is from fifteen to twenty years.

* Ray's Wisdom of God, in the Works of the Creation.
† See Home, Comparative Anatomy, vol. iii., p. 180.

Canis aureus, LINNÆUS.—*Le Chacal*, FRED. CUVIER.

There is no essential difference in the jackal and the dog; and in the principal point which determines the identity of a species—the power of continuing a mixed variety—the dog, the wolf, and the jackal are entirely similar. The difference, therefore, which certainly exists in their characters, must be found in hereditary habit, whether among the domesticated or the wild varieties.

The jackal is found in Africa, from the Cape of Good Hope to Barbary; in Syria, in Persia, and in all Southern Asia. It is considered by the best

commentators, that the three hundred foxes to whose tails Samson tied firebrands were jackals. Their habit of assembling together in large troops, so as to be taken in considerable numbers, justifies this conclusion; for the fox is a solitary animal.* To the inhabitants of hot countries the jackal is of the same service as the vulture and the hyæna. He does not require living prey to feed upon; but, wherever there is an animal body in a state of decomposition, his nose scents it at a great distance, and the air is soon freed from the putrescence.

But the jackal is still a beast of prey; and the association of the species in strong packs enables them to hunt down the antelope and the sheep. He has been popularly called "the lion's provider." The common notion that he is in confederacy with the lion, for the chase of their mutual prey, is an erroneous one. At the cry of the jackal, echoed as it is by hundreds of similar voices through the woods and arid plains, the lion, whose ear is dull, rouses himself into action. He knows that some unhappy wanderer from the herds has crossed the path of the jackal, and he joins in the pursuit. Of this nocturnal cry we have read the most fearful accounts. "The chacal's shriek"† has been often described as more terrific than the howl of the hyæna or the roar of the tiger; and it probably is most alarming, from its singular dreariness amid the lonely regions in which it is heard. It is well described in Captain Beechey's account of his expedition to explore the Northern Coasts of Afri-

* See "Fragments, intended as an Appendix to Calmet," 2 vols. 4to, 1800.

† Leyden's Poems.

ca: "The cry of the jackal has something in it rather appalling when heard for the first time at night; and as they usually come in packs, the first shriek which is uttered is always the signal for a general chorus. We hardly know a sound which partakes less of harmony than that which is at present in question; and, indeed, the sudden burst of the answering long-protracted scream, succeeding immediately to the opening note, is scarcely less impressive than the roll of the thunder-clap immediately after a flash of lightning. The effect of this music is very much increased when the first note is heard in the distance (a circumstance which often occurs), and the answering yell bursts out from several points at once, within a few yards or feet of the place where the auditors are sleeping."

The difficulty of domesticating the jackal, if it were desirable, would arise from two causes. The one is the strong odour which he emits, as filthy as that of the fox; and yet it is said that the skunk (a species of civet) loses its offensive smell in captivity. The other cause is the extreme timidity of the jackal at the sight of a stranger; he flies when he is approached, although he attempts no resistance when touched. This is, perhaps, a peculiarity arising out of confinement; for Captain Beechey says that he has frequently gone close up within a few yards of a jackal in the wild state before he would turn to walk away.

Canis decussatus, GEOFFROY.—*Renard croissé*, DESMAREST.

The *Cross Fox*, in the Gardens of the Zoological Society, differs very little in shape from the common fox. The colour of his fur is a sort of gray, resulting from the mixture of black and white hair; he has a black cross on his shoulders, from which he derives his name. The muzzle, the lower parts of the body, and the feet, are black; the tail is terminated with white.

This species of fox is a native of North America; and in his habits he differs very little from the fox of Europe. Whether found in the Old or New World, the fox is the same wily and voracious an-

imal; greedily seizing upon birds and small quadrupeds, either in the woods or near the habitations of man; burrowing with great ingenuity, so as to elude observation, and providing for escape with equal sagacity; hunted by man; disliked and betrayed by most of those animals who have a dread of his attacks; and extremely difficult to be tamed, even when caught very young.

The fox, like the wolf, is the constant object of persecution, from the ravages which he commits upon the exposed property in the fields and habitations of men. He has been a destroyer of vineyards from the earliest times; "Take us the foxes, the little foxes, that spoil the vines."* He devours honey; he sucks eggs; he carries off poultry; he kills the hare in her form, and the rabbit in the warren. He is, therefore, universally hunted and destroyed. In England the breed is not extinct, partly from the extreme prudence of the animal, and partly because it is considered unsportsmanlike to kill a fox except in the chase. Fox-hunting, perhaps, furnishes the best excuse for the continuance of a custom which, although it has been called an instinct of man, must certainly be an instinct belonging to a very rude and early state of society.

The fox may in some degree be considered a nocturnal animal; for, in a strong light, the pupil of the eye contracts, like that of the cat.

The female fox produces four or five whelps at a litter, which arrive at maturity in about eighteen months, and live, upon the average, thirteen or fourteen years.

* Song of Solomon.

Having thus noticed many interesting specimens, and given some general particulars, of the family of dogs, we subjoin their scientific character:

The group of carnivorous quadrupeds, known by the name *Canis*, and which is found in all parts of the habitable globe, excepting a few islands of the Pacific Ocean, comprehends the dog, the wolf, the jackal, and the fox.

The teeth of this group are thus arranged:

Incisors, $\frac{6}{6}$, Canine, $\frac{1-1}{1-1}$, Molar, $\frac{6-6}{7-7}$, Total, 42. They have two tuberculous teeth behind each carnivorous one. Their teeth are equally fitted for devouring animal and vegetable substances.

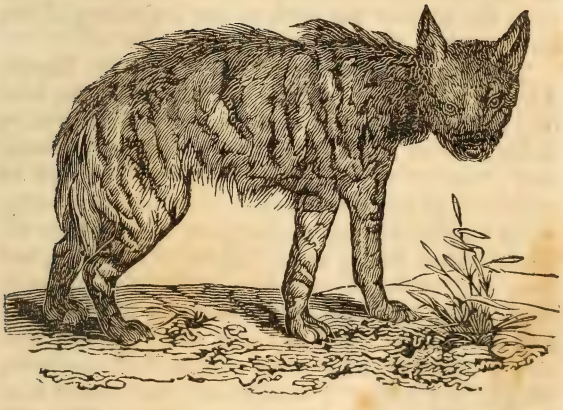
The tongue is not rough, as in the cat, but perfectly smooth.

They walk upon the ground with their toes, which have curved claws for scratching the earth. These claws are not retractile, or capable of being drawn back within a sheath. Each of the four feet has five toes, four of which only touch the ground. The hind feet have generally four toes, though in a few varieties a fifth is developed.

In the dog, the wolf, and the jackal, the pupils of the eyes are round; in the fox, they are transversely linear.

CHAPTER V.

THE HYÆNA.



Striped Hyæna. *Hyæna vulgaris*, DESMAREST.—*Canis Hyæna*, LINNÆUS.

OF this animal there are only two species now known, the striped and the spotted. Desmarest gives the height of the striped hyæna, at the shoulders, as nineteen inches. The ordinary length of the body, from the muzzle to the tail, is about three feet three inches. The colour of the striped hyæna is a brownish gray, with transverse bands of dark brown on the body, which stripes become oblique on the flank and the legs. The hide is composed of two

sorts of hair; the fur or wool in very small quantity, and the silky hair, long, stiff, and not very thick, excepting on the limbs, where the hair is short and close, and on the muzzle, which is quite shaven. as well as the external face of the ears. The hair upon the line of the back is much thicker and stronger than on any other part, particularly on the withers, forming a sort of mane, extending from the nape of the neck to the beginning of the tail, which is also covered with long hair.

The striped hyæna is a native of Barbary, Egypt, Abyssinia, Nubia, Syria, and Persia. This species was known to the ancients, and is described by Aristotle with much correctness. Pliny, however, and other writers on natural history, have left us abundant proofs of the extent of human credulity, when employed upon such objects as ferocious animals, whose habits were imperfectly known, and were calculated to produce terror and disgust. The hyæna possesses great strength in the neck; and for this reason Pliny and other ancient writers believed that his neck consisted of one bone, without any joint. The ancients considered also, as may be seen by a passage in Lucan's Pharsalia (lib. vi., 672), that this neck without a joint was of peculiar efficacy in magical invocations. Shaw tells us, in his travels, that the Arabs, when they kill a hyæna, bury the head, lest it should be made the element of some charm against their safety and happiness. It is in this way that superstitions extend themselves through the world, and endure for many generations. The Greeks and Romans believed, too, of the hyæna, that it could change its sex; that it imitated the human voice (the popular

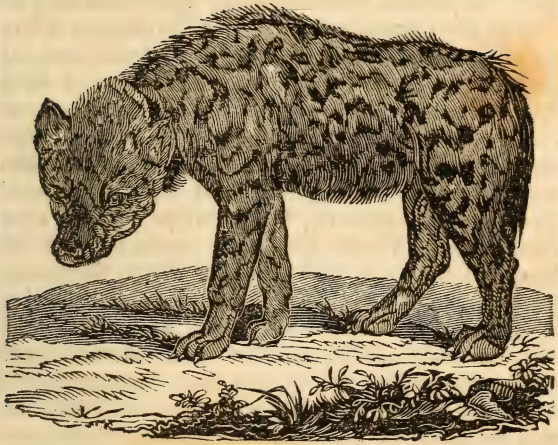
name of *laughing* hyæna is, perhaps, derived from this notion), and that it had the power of charming the shepherds, so as to rivet them to the spot upon which they were met by the quadruped, in the same way that a serpent fascinates a bird. A somewhat similar notion prevailed among the poets and naturalists of antiquity with regard to the wolf; they affirming that if a man encountered a wolf, and the wolf first fixed his eye upon him, he was rendered incapable of speaking, and became permanently dumb. These stories, both of the hyæna and the wolf, are evidently exaggerations of the fear which would naturally be produced by the sudden encounter with a ferocious and dangerous animal. Many of the notions of antiquity, with regard to the structure and habits of animals, were equally irrational. It was gravely maintained, for instance, that the elephant had no joints, and, being unable to lie down, slept leaning against a tree; that the badger had the legs of one side shorter than those of the other; that the bear brought forth her cubs imperfectly formed, and licked them into shape; that deer lived several hundred years; that the chameleon derived its support solely from the atmospheric air. These, and many other fancies, proceeded either from a literal construction of metaphorical expressions, or a complete ignorance of the economy of nature, with regard to the laws by which animal life is regulated. "There are no grotesques in nature." Such errors as these have long since been exploded, and the cause of real knowledge has been, therefore, greatly advanced by the substitution of the true for the fabulous. The popular interest of natural history is not necessarily reduced by this separation of

fact from fiction: for the more we examine the operations of nature, the more shall we be sensible of the real wonders which they present; but which, however extraordinary they may appear, are never inconsistent with the great principles of organization, and are never calculated to present any exceptions to the beauty and harmony of that design by which every living thing is formed and sustained.

The qualities of the two sorts of hyæna are so similar, that we may simplify our description of the habits of each, by describing, at this point, the particular appearance of the spotted species.

The spotted hyæna is a native of Southern Africa; and the species is found in large numbers in the neighbourhood of the Cape of Good Hope; from this circumstance Desmarest named it. The general shape of this hyæna is very similar to that of the striped, though it is ordinarily smaller. The mane is remarkable, but not quite so full as in the striped species. The general colour of the hide is a dirty yellow, approaching to a blackish brown on the belly and limbs, with spots also of a blackish brown, more or less deep, on all parts of the body, excepting the under part of the belly and of the breast, the inner surface of the limbs, and the head; the extremity of the muzzle is black; the tail is brown, without spots.

The peculiar powers of the hyæna, arising out of the extraordinary strength of his jaws and teeth, admirably fit him for the purposes which he serves in the economy of nature. An inhabitant of warm countries, he principally derives his subsistence, in common with the jackal and the vulture, from those



Spotted Hyæna. Canis crocuta, LINNÆUS.—*Hyæna Capensis* DESMAREST.

animal remains which, if unconsumed, would produce the most serious inconvenience. All the narratives of residents in, or travellers through, Southern Africa, agree in their accounts of these facts. Mr. Pringle, in the notes to his "Ephemerides," says, "There are several species of the vulture in South Africa, but the most common is the large light-coloured *vultur percnopterus*, one of the sacred birds of the ancient Egyptians. These fowls divide with the hyænas the office of carrion-scavengers; and the promptitude with which they discover and devour every dead carcass is truly surprising. They also instinctively follow any band of hunters, or party of men travelling, especially in

solitary places, wheeling in circles high in the air, ready to pounce down upon any game that may be shot and not instantly secured, or the carcass of any ox or other animal that may perish on the road. I have seen a large ox so dexterously handled by a flock of these voracious fowls, that in the course of three or four hours not a morsel, except the bones and the skin (which they had contrived to *disincarnate* almost entire), remained for the hyænas. In a field of battle in South Africa, no one ever buries the dead; the birds and beasts of prey relieve the living of that trouble. Even the bones, except a few of the less manageable parts, find a sepulchre in the voracious maw of the hyæna." Mr. Burchell, speaking of the office of vultures in hot regions, says, "Vultures have been ordained evidently to perform very necessary and useful duties on the globe; as, indeed, has every other animated being, however purblind we may be in our views of their utility; and we might almost venture to declare that those duties are the final cause of their existence. To those who have had an opportunity of examining these birds, it need not be remarked how perfectly the formation of a vulture is adapted to that share in the daily business of the globe which has been allotted to it; that of clearing away putrid or putrescent animal matter, which might otherwise taint the air and produce infectious disease." The vulture is enabled to perform these duties, in countries of great extent and thinly scattered population, principally from his extraordinary powers of *sight*. The wonderful extent of this bird's eye is shown in the following instance: "In the year 1778, Mr. Baber and several other

gentlemen were on a hunting party in the island of Cossimbuzar, in Bengal, about fifteen miles north of the city of Murshedabad. They killed a wild hog of uncommon size, and left it on the ground near the tent. An hour after, walking near the spot where it lay, the sky perfectly clear, a dark spot in the air at a great distance attracted their attention. It appeared to increase in size, and move directly towards them: as it advanced, it proved to be a vulture flying in a direct line to the dead hog. In an hour, seventy others *came in all directions*, which induced Mr. Baber to remark, this cannot be smell."* The faculty of *smell* of the hyæna conducts him as certainly to his food as the *sight* of the vulture. Major Denham tells us in his Journal, "the hyænas came so close to the tents last night, that a camel, which lay about a hundred yards from the enclosure, was found nearly half eaten. A lion first made a meal on the poor animal, when the hyænas came down upon what he had left." Mr. Burchell says, "A new species of antelope, which had been shot late on the preceding evening, was fetched home; but, during the night, the hyænas, or wolves as they are usually called by the Boors and Hottentots, had devoured all the flesh, leaving us only the head and hide." These, and many more instances which we might select, show us that in these regions, in the very hour when any quadruped falls, the sharp-scented hyænas immediately make their appearance, and rush into the encampments of man for their share of the prey. At the Cape, they formerly came down into the town, unmolested by the inhabitants, to clear the

* Home, Comp. Anat., vol. iii., p. 216.

shambles of their refuse. The common notion that they tear newly-buried bodies out of graves is not inconsistent with their extraordinary voracity and the peculiar strength of their claws. It is well ascertained that hyænas devour the dead carcasses of their own species.

But the depredations of the hyæna are not confined to the remains of the dead. There are periods when they become bold from extreme hunger, and will carry off very large animals, and even human beings, with the most daring ferocity. Major Denham says, "at this season of the year" (August), "there are other reasons besides the falls of rain which induce people to remain in their habitations. When the great lake overflows the immense district which, in the dry season, affords cover and food, by its coarse grass and jungle, to the numerous savage animals with which Bornou abounds, they are driven from these wilds, and take refuge in the standing corn, and sometimes in the immediate neighbourhood of the towns. Elephants had already been seen at Dowergoo, scarcely six miles from Kouka; and a female slave, while she was returning home from weeding the corn to Kowa, not more than ten miles distant, had been carried off by a lioness. The hyænas, which are everywhere in legions, grew now so extremely ravenous, that a good large village, where I sometimes procured a draught of sour milk on my duck-shooting excursions, had been attacked the night before my last visit, the town absolutely carried by storm, notwithstanding defences nearly six feet high of branches of the prickly tulloh, and two donkeys, whose flesh these animals are particularly fond of,

carried off, in spite of the efforts of the people. We constantly heard them close to the walls of our own town at nights; and, on a gate being left partly open, they would enter and carry off any unfortunate animal that they could find in the streets."

With this strong desire for food, approaching to the boldness of the most desperate craving, the hyæna, although generally fearful of the presence of man, is an object of natural terror to the African traveller. Bruce relates, that one night in Maibsha, in Abyssinia, he heard a noise in his tent; and, getting up from his bed, saw two large blue eyes glaring upon him. It was a powerful hyæna, who had been attracted to the tent by a quantity of candles, which he had seized upon, and was bearing off in his mouth. He had a desperate encounter with the beast, but succeeded in killing him.

The hyæna has always been an object of aversion to mankind: and this feeling has been kept up, not only by the showman's stories of "that cruel and untameable beast, that never was yet tamed by man," but by writers of natural history, from the days of Pliny to those of Goldsmith. The latter pleasant compiler tells us, "no words can give an adequate idea of this animal's figure, deformity, and fierceness. More savage and untameable than any other quadruped, it seems to be for ever in a state of rage or rapacity." With regard to its deformity, we are rather of opinion with Sir Thomas Brown, that "there is a general beauty in the works of God; and, therefore, no deformity in any kind of species of creature whatsoever;" and, with him, we "cannot tell by what logic we call a toad, a bear, or an elephant ugly, they being created in those

outward shapes and figures which best express those actions of their inward forms."* That the hyæna can be tamed, and most completely and extensively so, there can be no doubt. "The cadaverous *crocuta*" (the spotted hyæna), says Barrow, in his Travels in Southern Africa, "has lately been *domesticated* in the Snewberg, where it is now considered one of the best hunters after game, and as faithful and diligent as any of the common sorts of domestic dogs." Bishop Heber saw a gentleman in India, Mr. Traill, who had a hyæna for several years, which followed him about like a dog, and fawned on those with whom he was acquainted; and the bishop mentions this as an instance of "how much the poor hyæna is wronged when he is described as untameable." M. F. Cuvier notices an animal of this species that had been taken young at the Cape, and was tamed without difficulty. His keepers had a complete command over his affections. He one day escaped from his cage, and quietly walked into a cottage, where he was retaken without offering any resistance. And yet the rage of this animal was occasionally very great when strangers approached it. The fact is, that the hyæna is exceedingly impatient of confinement, and feels a constant irritation at the constraint which, in the den of a menagerie, is put upon his natural habits. An individual at Exeter Change, some years ago, was so tame as to be allowed to walk about the exhibition-room. He was afterward sold to a person who permitted him to go out with him into the fields, led by a string. After these indulgences, he became the property of a travelling showman,

* Religio Medici, § 16.

who kept him constantly in a cage. From that time his ferocity became quite alarming; he would allow no stranger to approach him, and he gradually pined away and died. This is one out of the many examples of the miseries we inflict upon animals through ignorance of their natural habits: and the same ignorance perpetuates delusions, which even men of talent, like Goldsmith, have adopted, and which still, in the instance before us, leads many to say, with him, "though taken ever so young, the hyæna cannot be tamed." It is very doubtful whether any animal, however fierce, is incapable of being subjected to man. Mr. Barrow procured in Africa a young leopard, which he says "became instantly tame, and as playful as the domestic kitten." He adds, "most beasts of prey, if taken young, may almost instantly be rendered tame. The fierce lion or the tiger is sooner reconciled to a state of domestication than the timid antelope." And this is evidently a most wise arrangement of Providence, in order that the progress of civilization, with the dominion which man has over the beasts of the field, shall not necessarily exterminate the races of the inferior animals. The fierce buffalo of the African plains, by an intermixture of breeds and by training, becomes the patient ox of European communities; the hyæna assists the colonists of the Cape in the business (for to them it is a business) of the chase; the hunting leopard renders the same service to the natives of Hindostan; and the Esquimaux dog, as we have already seen, is, in all probability, a wolf in a state of servitude.

The subject of hyænas is intimately connected with a most interesting branch of natural science, which it would be wrong here to pass over; we mean the discovery of large quantities of bones, which must have belonged to this tribe at a very distant period, in various parts of the European Continent and in Great Britain. This fact, connected with the discovery, from time to time, of the bones of the elephant, rhinoceros, hippopotamus, crocodile, and other animals, in considerable quantities, is one of the most extraordinary circumstances in the history of the globe; and involves a discussion, whether these bones have been brought hither by some great convulsion of nature, such as the deluge, or whether they belonged to animals which were formerly inhabitants of the countries where they are found.

Casting a general view over the animal and also the vegetable kingdoms, as they at present exist, we find that animals and plants are generally distributed over the earth in bands or parallel zones, according to the degree of temperature which accords with their respective natures. On the tops of mountains, where the air is cold, we find the animals and plants which are natives of climates near the poles; and in the plains, where the air is mild and warm, we encounter species which are somewhat similar to those of the countries near the equator. Tournefort, a celebrated botanist, found at the top of Mount Libanus the plants of Lapland; a little lower down, those of Sweden; still lower, those of France; descending near to the base,

those of Italy; and at the foot of the mountain, those of Asia. In the same manner there are zones of different temperature on the whole earth, ascending from the equator as from the base of a mountain; and each plant or animal is fitted by nature for a peculiar existence conformable to the climate in which it is found. When, therefore, we discover in England and in the northern parts of Europe the remains of animals which we know are at present the inhabitants of tropical regions, we are natually led to consider, either that the bones have been swept hither from those regions, or that some great change has taken place in our globe, of which this change in the residence (called by naturalists the *habitat*) of animals is the result. Sir Humphrey Davy has shown that a very high tempertaure was necessary to the production of crystals and the waters contained in them; and it is therefore considered by some geologists that the surface of our globe has been gradually cooling, particularly as experiment has determined that the metals and waters met with at the greatest depth to which man has penetrated are at present hotter than the surface of the earth is at the equator. The geologists conclude, therefore, that there was a time when the surface of the earth was too hot for the production of animals and vegetables; that tropical animals were its first living inhabitants; and that there was a period when the climate of Europe was adapted to such animals.

Collections of the bones of hyænas have been found in large quantities in Franconia, in the Hartz Forest, in Westphalia, in Saxony, in Wirtemberg, in Bavaria, and in France. But the most remark-

able discovery was that made by Professor Buckland, of Oxford, in a cave at Kirkdale, or Kirby Moorside, Yorkshire, in the summer of 1822. Bones of a similar nature, some in large and some in smaller quantities, had previously been found in different caverns in England.

The cave of Kirkdale is a natural fissure or cavern, extending three hundred feet into the body of the solid limestone rock, and varying from two to five feet in height and breath. It was discovered accidentally in the progress of working a stone quarry, as the mouth was closed with rubbish. It is situated on the slope of a hill, about one hundred feet above the level of a small river. The bottom of the cavern is nearly horizontal, and is entirely covered, to the depth of about a foot, with a sediment of mud. The surface of this mud is, in some parts, crusted over with limestone, formed by droppings from the roof. At the bottom of this mud, the original floor of the cave is covered with teeth and fragments of bone of the following animals: the hyæna, the elephant, the rhinoceros, the hippopotamus, the horse, the ox, two or three species of deer, the bear, the fox, the water-rat, and several birds.

The inference which is drawn by Professor Buckland respecting these bones, is, that they were accumulated before the deluge in this cave or den, and that the black mud with which they are covered over is the sediment left by the waters of the flood. The effect of this mode of preserving them has been, that the bones are not at all mineralized, but actually retain nearly the whole of their animal jelly.

The bones are, for the most part, broken and

gnawed to pieces, and the teeth lie loose among the fragments of the bones. Among these the teeth of hyænas are most abundant, the greater part of which are worn down almost to the stumps, as if with the operation of gnawing bones. Professor Buckland considers that hyænas must have been the antediluvian inhabitants of the den at Kirkdale, and the other animals, whose bones are found, must have been carried in for food by the hyænas, the smaller animals, perhaps, entire, the large ones piecemeal. Judging from the properties of the remains found in the den, the ordinary food of the hyænas seems to have been oxen, deer, and water-rats; the bones of the larger animals are more rare; and the fact of the bones of the hyæna being broken up equally with the rest, renders it probable that they devoured the dead carcasses of their own species. Many of the bones bear the impress of the canine fangs of the hyæna. Some of the bones and teeth appear to have undergone various stages of decay by lying in the bottom of the den while it was inhabited; but little or none has taken place since the introduction of the earthy sediment in which they are imbedded.

The discoverer of these remains contends, from the evidence afforded by the interior of this den, that all these animals whose bones are there found, lived and died in its vicinity; and as the bones belong to the same species which occur in a fossil state in the beds of gravel with which England abounds, it follows that the period in which they inhabited these regions was that immediately preceding the formation of these gravel-beds by some transient and universal inundation, which has left

traces of its ravages over the surface of the whole globe. Professor Buckland concludes that the accuracy of the Mosaic records is thus satisfactorily established in all essential particulars.

The Fossil (or extinct) Hyæna, according to Cuvier, was about a third larger than the striped species; with the muzzle, in proportion, much shorter. The teeth, as to form, resembled those of the spotted species, but they were considerably larger. The powers of the animal, particularly in its faculty of gnawing bones, were therefore greater than those of the existing races.

The division of carnivorous quadrupeds called Hyæna is scientifically distinguished by having no small or tuberculous teeth behind the carnivorous. Its teeth are thus arranged:

Incisors $\frac{6}{6}$, Canine $\frac{1}{1}-\frac{1}{1}$, Molar $\frac{5}{4}-\frac{5}{4}$, Total 34. These teeth are particularly adapted for breaking bones, from their thickness.

The head is of a middle size, with an elevated forehead; the jaws shorter than those of the dogs, and longer than those of the cats; the tongue rough; the eyes large, with longitudinal pupils; the ears long, pricked, easily moveable, very open, and directed forward; the nostrils resemble those of the dogs.

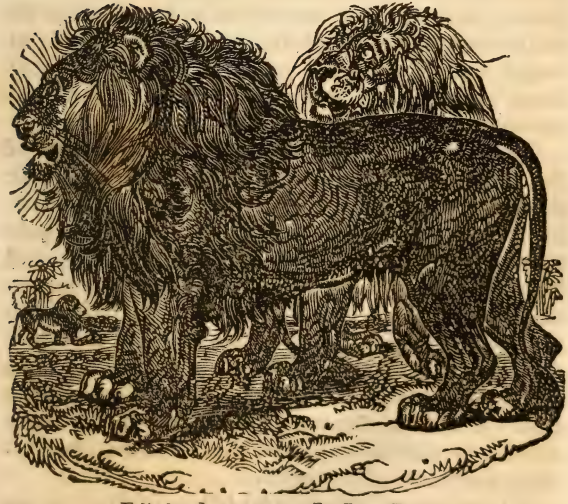
They are *digitigrade*, or walk on their toes; their feet are terminated with four toes, of which the claws, which are very strong, are not retractile; the fore-legs appear more elevated than the hind. Beneath the tail is a glandulous pouch.

Naturalists have not ascertained the period of gestation, and other circumstances, such as the

number of young at a litter, connected with the reproduction of the hyæna; nor do we find their average duration of life stated by any writer of authority.

CHAPTER VI.

THE LION.



Felis leo, LINNÆUS.—*Le Lion*, BUFFON.

THE most interesting object of a menagerie is probably its lion; and there are few persons who

are not familiar with the general appearance of this most powerful animal. To behold, in perfect security, that creature which is the terror of all travellers in the regions where he abounds; which is said to be able to bear off a buffalo on his back, and crush the scull of a horse by a single stroke of his paw; this is certainly gratifying to a reasonable curiosity. The appearance of dignified self-possession which the lion displays when at rest; his general indifference to slight provocations; his haughty growl when he is roused by the importunities of his keepers or the excitement of the multitude; his impatient roar when he is expecting his daily meal, and his frightful avidity when he is at length enabled to seize upon his allotted portion; these are traits of his character in confinement which are familiar to almost every one.

The ordinary length of the lion, from the end of the muzzle to the insertion of the tail, is about six feet, and the height above three feet. The uniformity of his colour is well known, being of a pale tawny above, and somewhat lighter beneath; and his enormous mane is a characteristic which no one can forget. The long tuft of rather black hair which terminates his tail may not have been so generally observed; but this is peculiar to his species. The pupils of his eyes are round. The lioness differs from the lion in the want of a mane, in the more slender formation of her body, and in the comparative smallness of her head.

To understand the natural habits of the lion, we must not be satisfied to observe him in menageries, where, ordinarily, his disposition is soon subjected by that fear of man which constitutes a feature of

his character. We may, indeed, observe the form of this magnificent beast; and may occasionally be delighted by his gentleness and entire submission to the commands of his capricious masters. But we must compare our own impressions of his character with the accounts of intelligent travellers; we must examine the peculiar structure of his body, as developed by skilful and patient anatomists; and we may then return to view the lion of the showman with correct notions of his physical powers, and with unromantic estimates of his moral qualities. It has been too much the fashion with writers on natural history to have their antipathies and their partialities towards the ferocious quadrupeds; and thus, as the hyæna has been represented as combining every disgusting and offensive habit, so has the lion been painted as possessed of the most noble and magnanimous affections. "The King of the Beasts" is a name applied to him, with which every one is familiar. In physical strength he is indeed unequalled. He is ordained by nature to live on animal food, and fitted for the destruction of animal life by the most tremendous machinery that could be organized for such a purpose, regulated by a cunning peculiar to his species. But when we investigate the modes in which he employs these powers, we may perhaps be inclined to leave the stories of his generosity to the poets and romance-writers, who (as well as the authors of more sober relations) have generally been too much inclined to invest physical force with those attributes of real courage and magnanimity which are not always found in association with it.

To comprehend the habits of the lion, we must

follow with attention the narratives of those travellers who have seen him in his native haunts. From the Cape of Good Hope, for instance, an adventurous naturalist sets forth to explore the immense plains of the interior of Southern Africa. His journey is performed partly on foot and partly in a wagon drawn by eight or ten oxen. His escort consists of a few sturdy Hottentots, accustomed to the country into which he desires to penetrate, excellent marksmen, and expert in following up the track of every wild or ferocious beast. Farther and farther he rolls on from the abodes of civilization, and soon finds himself surrounded by tribes of Bushmen or Caffres, who live in a rude but contented manner, depending for subsistence upon their flocks and upon the chase, and knowing very few of those agricultural arts by which their arid plains might be partially redeemed from sterility. At length he reaches those parts where ferocious animals abound; and where the lion, particularly, is an object of dread. Having passed the borders of European colonization, his fears are first excited by viewing the footmarks of the lion. His Hottentot guides have their tales of terror ready for the traveller, who beholds for the first time the impress of those tremendous feet upon the sands of the plain which he is to cross; and they are ready to show their skill in tracking, if necessary, the prowling savage to his lair. So nice is this faculty in a Hottentot, of tracking footsteps, that Mr. Barrow tells us he will distinguish the wolf from the domestic dog by the largeness of the ball of the foot and the comparative smallness of the toes; and will single out among a thousand any of his companions' feet.

This is an effect of education, an ability produced by the constant exercise of a peculiar faculty, which has been acquired by early training. It is the same ability by which a skilful shepherd is enabled to know every individual sheep belonging to his flock; and its exercise in each case proceeds from that habit of attention which enables the human mind to attain excellence in every pursuit. But even a Hottentot does not discover the footsteps of a lion without fear. Mr. Burchell, with his man Gert, was in search of a party who had killed a hippopotamus. They were hurrying on through a willow-grove, when the Hottentot suddenly stopped, and cried out with some emotion, "Look here, sir!" Mr. Burchell continues: "I turned my eyes downward, and saw the recent footmarks of a lion, which had been to drink at the river apparently not more than an hour before. This gave a check to our dialogue on the hippopotamus; and, in a lower and graver tone of voice, he talked now only of lions, and the danger of being alone in a place so covered with wood." That immediate danger passed away, but new fears of the same nature were constantly presenting themselves. Mr. Barrow says: "It seems to be a fact well established, that the lion prefers the flesh of a Hottentot to any other creature;" and the same writer states, in another place, that this powerful and treacherous animal seldom makes an open attack, but, like the rest of the feline genus, lies in ambush till it can conveniently spring upon its prey. The best security which man and beast have against the attacks of the lion is found in his indolence; he requires the strong excitement of hunger to be roused to a pursuit; but, when he

is roused, his vaunted magnanimity is no protection, even for a sleeping foe, as the poets have pretended.

We must, however, follow our African traveller a little farther in his career of observation. A lowering evening comes on; thunder-clouds collect in every quarter; and the night becomes extremely dark. The most vivid flashes of lightning are intermingled with the heaviest torrents of rain. The cattle are restless; and the Hottentots are prevented making their evening fire for the cookery of their supper, and for defence against the beasts of prey. On such nights as these the lion is particularly active. The fury of the elements appears to rouse him from his ordinary torpidity. He advances upon his prey with much less than his usual caution; and he is not at once driven off by the barking of dogs and the sound of muskets. The oxen of the caravan, who appear to scent the distant approach of their terrible enemy, struggle to break loose from their wagons to escape their danger by instant flight; an escape which would prove their destruction. It is only by keeping with man that they are safe. The repeated discharge of fire-arms has the remarkable effect not only of keeping off the lion, but of abating the restlessness of the cattle. They appear to feel that their enemy will retreat when he hears this demonstration of the powers of the only creature that is enabled, by superior reason, to cope with him. Nights of such harassing watchfulness are not unfrequently experienced by the African traveller.*

It is no uncommon thing in the plains of Southern Africa to encounter innumerable herds of wild

* See Burchell's Travels, vol. i., chapter xviii.

animals, quietly grazing like tame cattle. Wherever the quagga (a species of wild ass), the springbok, and the hartebeest (the Dutch names for two varieties of the antelope) are found, there will be lions, numerous in proportion, for the destruction of their prey. Of course those formidable beasts can only exist where the means of their support are to be procured. They are destined to live on animal food; and, therefore, where there are flocks and herds, whether in a wild or a domestic state, there they will be also. Mr. Campbell states that the quagga migrates in winter from the tropics to the vicinity of the Malaleveen river; which, though farther to the south, is reported to be considerably warmer than within the tropics, when the sun has retired to the northern hemisphere. He saw bands of two or three hundred quaggas, all travelling southward. They are followed by lions, who slaughter them night by night; and what the lions leave of the carcasses of these unfortunate animals, is devoured by the vultures and the Bushmen. Even the buffalo, whose forehead, when he is of mature age, is completely covered with a rugged mass of horn as hard as a rock, the fibres of whose muscles are like so many bundles of cords, and whose hide is little inferior in strength and thickness to that of the rhinoceros, even he is not safe from the attacks of the lion. "He lies waiting for him in ambush till a convenient opportunity offers for springing upon the buffalo and fixing his fangs in his throat; then sticking his paw into the animal's face, he twists round the head and pins him to the ground by the horns, holding him in that situation till he expires from loss of blood."*

* Barrow vol. i.

It has been often stated by travellers in Africa, and the statement has been repeated by Mr. Pringle, upon the authority of a chief of the Bechuanas, that the lion, after he has made his fatal spring upon the giraffe when he comes to drink at the pools, is carried away for miles, fixed on the neck of that fleet and powerful creature, before his victim sinks under him.

To the traveller in Africa the lion is formidable not at night only; he lies in his path, and is with difficulty disturbed to allow a passage for his wagons and cattle, even when the sun is shining with its utmost brilliancy; nor he is roused from some bushy place on the roadside by the indefatigable dogs which always accompany a caravan. Mr. Burchell has described with great spirit an encounter of this nature:

"The day was exceedingly pleasant, and not a cloud was to be seen. For a mile or two we travelled along the bank of the river, which in this part abounded in tall mat-rushes. The dogs seemed much to enjoy prowling about and examining every bushy place, and at last met with some object among the rushes which caused them to set up a most vehement and determined barking. We explored the spot with caution, as we suspected, from the peculiar tone of their bark, that it was what it proved to be, lions. Having encouraged the dogs to drive them out, a task which they performed with great willingness, we had a full view of an enormous black-maned lion and a lioness. The latter was seen only for a minute, as she made her escape up the river, under concealment of the rushes; but *the lion* came steadily forward and

stood still to look at us. At this moment we felt our situation not free from danger, as the animal seemed preparing to spring upon us, and we were standing on the bank at the distance of only a few yards from him, most of us being on foot and unarmed, without any visible opportunity of escaping. I had given up my horse to the hunters, and it was useless to attempt avoiding him. I stood well upon my guard, holding my pistols in my hand, with my finger upon the trigger, and those who had muskets kept themselves prepared in the same manner. But at this instant the dogs boldly flew in between us and the lion, and, surrounding him, kept him at bay by their violent and resolute barking. The courage of these faithful animals was most admirable; they advanced up to the side of the huge beast, and stood making the greatest clamour in his face, without the least appearance of fear. The lion, conscious of his strength, remained unmoved at their noisy attempts, and kept his head turned towards us. At one moment the dogs, perceiving his eyes thus engaged, had advanced close to his feet, and seemed as if they would actually seize hold of him; but they paid dearly for their imprudence; for, without discomposing the majestic and steady attitude in which he stood fixed, he merely moved his paw, and at the next instant I beheld two lying dead. In doing this he made so little exertion, that it was scarcely perceptible by what means they had been killed. Of the time which we had gained by the interference of the dogs, not a moment was lost; we fired upon him; one of the balls went through his side just between the short ribs, and the blood immediately began to

flow, but the animal still remained standing in the same position. We had now no doubt that he would spring upon us; every gun was instantly reloaded; but, happily, we were mistaken, and were not sorry to see him move quietly away, though I had hoped in a few moments to be able to take hold of his paw without danger.

"This was considered by our party to be a lion of the largest size, and seemed, as I measured him by comparison with the dogs, to be, though less bulky, as large as an ox. He was certainly as long in body, though lower in stature; and his copious mane gave him a truly formidable appearance. He was of that variety which the Hottentots and boors distinguish by the name of the *black lion*, on account of the blacker colour of the mane, and which is said to be always larger and more dangerous than the other, which they call the *pale lion* (vaal leeuw). Of the courage of a lion I have no very high opinion; but of his majestic air and movements, as exhibited by this animal while at liberty in his native plains, I can bear testimony. Notwithstanding the pain of a wound, of which he must soon afterward have died, he moved slowly away with a steady and measured step.

"At the time when men first adopted the lion as the emblem of courage, it would seem that they regarded great size and strength as indicating it; but they were greatly mistaken in the character they have given to this indolent, skulking animal, and have overlooked a much better example of true courage, and of other virtues also, in the bold and faithful dog."

Mr. Burchell, as we may learn from the forego-

ing extract, is not inclined to maintain the courage of the African lion, whatever impression he may have had of his extraordinary physical strength. The natural habits of the lion are certainly those of treachery; he is not disposed, under any circumstances, to meet his prey face to face; and he is particularly unwilling to encounter man when he crosses him in the full blaze of day. The inability of his eye (in common with most others of the cat-tribe) to bear a strong light, may account in a great degree for this circumstance, which has probably brought upon him much of the reproach of being a skulking, cowardly animal. But we apprehend that there were periods in the history of African colonization when the lion was of a bolder nature in his encounters with mankind; that the dread of firearms has become, in some degree, a habit of the species; and that he has sagacity or hereditary instinct to know that a flash and a loud sound is often followed by a speedy death or a grievous injury. One of the most remarkable examples of the audacity of a lion is to be found in the Journal of a Settler at the Cape more than a century ago. The first settlement of the Dutch at Cape Town was in the year 1652: the site which they selected was on the southern edge of Table Bay, and the number of the settlers amounted only to a hundred persons. In half a century the colonists had greatly increased, and had driven the native Hottentots a considerable distance into the interior, among dry and barren tracts. This is the ordinary course of colonization. In 1705, the landdrost,* Jos. Sterreberg Kupt, proceeded on a jour-

* A local magistrate.

ney into the country to procure some young oxen for the Dutch East India Company; and he has left a very interesting journal of his expedition, which has been translated from the original Dutch, and published by the Rev. Dr. Philip, in his truly valuable Researches in South America. The account which the landdrost gives of the adventure of his company with a lion is altogether so curious, that we extract it without abridgment:

"Our wagons, which were obliged to take a circuitous route, arrived at last, and we pitched our tent a musket-shot from the kraal; and, after having arranged everything, went to rest, but were soon disturbed: for, about midnight, the cattle and horses, which were standing between the wagons, began to start and run, and one of the drivers to shout, on which every one ran out of the tent with his gun. About thirty paces from the tent stood a lion, which, on seeing us, walked very deliberately about thirty paces farther, behind a small thornbush, carrying something with him, which I took to be a young ox. We fired more than sixty shots at that bush, and pierced it stoutly, without perceiving any movement. The southeast wind blew strong, the sky was clear, and the moon shone very bright, so that we could perceive everything at that distance. After the cattle had been quieted again, and I had looked over everything, I missed the sentry from before the tent, Jan Smit, from Antwerp, belonging to the Groene Kloof. We called as loudly as possible, but in vain; nobody answered; from which I concluded that the lion had carried him off. Three or four men then advanced very cautiously to the bush, which stood right opposite the door of the

tent, to see if they could discover anything of the man, but returned helter skelter, for the lion, who was there still, rose up and began to roar. They found there the musket of the sentry, which was cocked, and also his cap and shoes.

"We fired again about a hundred shots at the bush (which was sixty paces from the tent and only thirty paces from the wagons, and at which we were able to point as at a target) without perceiving anything of the lion, from which we concluded that he was killed or had run away. This induced the marksman, Jan Stamansz, to go and see if he was there still or not, taking with him a firebrand. But as soon as he approached the bush, the lion roared terribly and leaped at him, on which he threw the firebrand at him; and the other people having fired about ten shots, he retired directly to his former place behind that bush.

"The firebrand which he had thrown at the lion had fallen in the midst of the bush, and, favoured by the strong southeast wind, it began to burn with a great flame, so that we could see very clearly into and through it. We continued our firing into it; the night passed away, and the day began to break, which animated every one to aim at the lion, because he could not go from thence without exposing himself entirely, as the bush stood directly against a steep kloof. Seven men, posted on the farthest wagons, watched him to take aim at him if he should come out.

"At last, before it became quite light, he walked up the hill with the man in his mouth, when about forty shots were fired at him without hitting him, although some were very near. Every time this

happened he turned round towards the tent, and came roaring towards us; and I am of opinion that, if he had been hit, he would have rushed on the people and the tent.

"When it became broad daylight, we perceived, by the blood and a piece of the clothes of the man, that the lion had taken him away and carried him with him. We also found behind the bush the place where the lion had been keeping the man, and it appeared impossible that no ball should have hit him, as we found in that place several balls beaten flat. We concluded that he was wounded, and not far from this. The people therefore requested permission to go in search of the man's corpse in order to bury it, supposing that, by our continued firing, the lion would not have had time to devour much of it. I gave permission to some, on condition that they should take a good party of armed Hottentots with them, and made them promise that they would not run into danger, but keep a good look-out, and be circumspect. On this seven of them, assisted by forty-three armed Hottentots, followed the track, and found the lion about half a league farther on, lying behind a little bush. On the shout of the Hottentots, he sprang up and ran away, on which they all pursued him. At last the beast turned round, and rushed, roaring terribly, among the crowd. The people, fatigued and out of breath with their running, fired and missed him, on which he made directly towards them. The captain, or chief head of the kraal, here did a brave act in aid of two of the people whom the lion attacked. The gun of one of them missed fire, and the other missed his aim, on which the captain threw himself between

the lion and the people so close, that the lion struck his claws into the caross (mantle) of the Hottentot. But he was too agile for him, doffed his caross, and stabbed him with an assagai.* Instantly the other Hottentots hastened on, and adorned him with their assagais, so that he looked like a porcupine. Notwithstanding this, he did not leave off roaring and leaping, and bit off some of the assagais, till the marksman Jan Stamansz fired a ball into his eye, which made him turn over, and he was then shot dead by the other people. He was a tremendously large beast, and had but a short time before carried off a Hottentot from the kraal and devoured him."

The lion is remarkable for dulness of the sense of hearing, difficulty in being awakened, and the want of presence of mind which he displays when suddenly awakened. It is this peculiarity which enables the Bushmen of Africa to keep the country tolerably clear of lions, without encountering any great danger in their exertions. Dr. Philip has well described it: "The wolf and the tiger generally retire to the caverns and ravines of the mountains, but the lion is most usually found in the open plain, and in the neighbourhood of the flocks of antelopes, which invariably seek the open country, and which manifest a kind of instinctive aversion to places in which their powerful adversary may spring upon them suddenly and unexpectedly. It has been remarked of the lion by the Bushmen, that he generally kills and devours his prey in the morning at sunrise, or at sunset. On this account, when they intend

* The generous bravery of this man towards strangers offers a striking refutation of the calumnies against the Hottentot race, which the Dutch colonists employed to defend their cruel and treacherous persecutions.

to kill lions, they generally notice where the spring-bucks are grazing at the rising of the sun; and by observing, at the same time, if they appear frightened and run off, they conclude that they have been attacked by the lion. Marking accurately the spot where the alarm took place, about eleven o'clock in the day, when the sun is powerful, and the enemy they seek is supposed to be fast asleep, they carefully examine the ground, and, finding him in a state of unguarded security, they lodge a poisoned arrow in his breast. The moment the lion is thus struck, he springs from his lair and bounds off as helpless as the stricken deer. The work is done; the arrow of death has pierced his heart, without even breaking the slumbers of the lioness which may have been lying beside him; and the Bushman knows where, in the course of a few hours, or even less time, he will find him dead, or in the agonies of death."*

We have thus traced the African lion as he appears to the traveller in solitary districts of that immense continent, and where the presence of man may in some sort be considered an intrusion upon his legitimate empire. But the lion does not confine his range to the desert plains, trusting for a supply of food to the herds of antelopes and wild asses, which live far away from the abodes of mankind. In the country of the Namaaquas, where there are numbers of Dutch settlers, he is often found prowling around the herds of the colonists. Mr. Barrow tells an interesting anecdote of the escape of a Hottentot from a lion, which pursued him from a pool of water where he was driving his cattle to drink, to an aloe-tree, in which the man remained for twenty-four hours, while the lion laid himself

* Philip's South Africa, vol. ii.

down at the foot. The perseverance of the beast was at length worn out by his desire to drink; and in his temporal absence to satisfy his thirst, the Hottentot fled to his home about a mile off. The lion, however, returned to the aloe-tree, and tracked the man within three hundred paces of his house.

Mr. Pringle, who had extraordinary opportunities of observing the habits of the half-civilized natives of Southern Africa, and of becoming acquainted with the characteristics of the wild beasts with which that part of the world abounds, has given us a very good description of a lion-hunt, in which he and several of his countrymen, all somewhat inexperienced in such adventures, were engaged. Mr. Pringle was a settler on the eastern frontier of the Cape colony; and in 1822 was residing on his farm, or "location," at Bavian's River. We should deprive his account of a lion-hunt of its interest if we attempted to give it in any other than his own words:

"One night a lion, that had previously purloined a few sheep out of my kraal, came down and killed my riding horse, about a hundred yards from the door of my cabin. Knowing that the lion, when he does not carry off his prey, usually conceals himself in the vicinity, and is very apt to be dangerous by prowling about the place in search of more game, I resolved to have him destroyed or dislodged without delay. I therefore sent a messenger round the location, to invite all who were willing to assist in the enterprise to repair to the place of rendezvous as speedily as possible. In an hour every man of the party (with the exception of two pluckless fellows who were kept at home by the women) appeared ready mounted and armed. We were

also re-enforced by about a dozen of the 'Bastaard' or Mulatto Hottentots, who resided at that time upon our territory as tenants or herdsmen; an active and enterprising, though rather an unsteady race of men. Our friends the Tarka boors, many of whom are excellent lion-hunters, were all too far distant to assist us, our nearest *neighbours* residing at least twenty miles from the location. We were, therefore, on account of our own inexperience, obliged to make our Hottentots the leaders of the chase.

"The first point was to track the lion to his covert. This was effected by a few of the Hottentots on foot. Commencing from the spot where the horse was killed, they followed the *spoor** through grass, and gravel, and brushwood, with astonishing ease and dexterity, where an inexperienced eye could discern neither footprint nor mark of any kind, until, at length, we fairly tracked him into a large *bosch*, or straggling thicket of brushwood and evergreens about a mile distant.

The next object was to drive him out of this retreat, in order to attack him in close phalanx, and with more safety and effect. The approved mode in such cases is to torment him with dogs till he abandons his covert, and stands at bay in the open plain. The whole band of hunters then march forward together, and fire deliberately one by one. If he does not speedily fall, but grows angry and turns upon his enemies, they must then stand close in a circle, and turn their horses rear-outward; some holding them fast by the bridles, while the others kneel to take a steady aim at the lion as he

* The Hottentot name for a footmark.

approaches, sometimes up to the very horses' heels; couching every now and then, as if to measure the distance and strength of his enemies. This is the moment to shoot him fairly in the forehead or some other mortal part. If they continue to wound him ineffectually till he waxes furious and desperate; or if the horses, startled by his terrific roar, grow frantic with terror and burst loose, the business becomes rather serious, and may end in mischief, especially if all the party are not men of courage, coolness, and experience. The frontier Boors are, however, generally such excellent marksmen, and, withal, so cool and deliberate, that they seldom fail to shoot him dead as soon as they get within a fair distance.

"In the present instance we did not manage matters quite so scientifically. The Bastaards, after recounting to us all these and other sage laws of lion-hunting, were themselves the first to depart from them. Finding that the few indifferent hounds we had made little impression on the enemy, they divided themselves into two or three parties and rode round the jungle, firing into the spot where the dogs were barking round him, but without effect. At length, after some hours spent in thus beating about the bush, the Scottish blood of some of my countrymen began to get impatient; and three of them announced their determination to march in and beard the lion in his den, provided three of the Bastaards (who were superior marksmen) would support them, and follow up their fire should the enemy venture to give battle. Accordingly, in they went (in spite of the warnings of some more prudent men among us) to within fifteen or twenty paces of

the spot where the animal lay concealed. He was couched among the roots of a large evergreen bush, with a small space of open ground on one side of it; and they fancied, on approaching, that they saw him distinctly, lying glaring at them from under the foliage. Charging the Bastaards to stand firm and level fair should *they* miss, the Scottish champions let fly together, and struck—not the lion, as it afterward proved, but a great block of red stone, beyond which he was actually lying. Whether any of the shot grazed him is uncertain; but, with no other warning than a furious growl, forth he bolted from the bush. The pusillanimous Bastaards, in place of now pouring in their volley upon him, instantly turned, and fled helter-skelter, leaving him to do his pleasure upon the defenceless Scots; who, with empty guns, were tumbling over each other in their hurry to escape the clutch of the rampant savage. In a twinkling he was upon them, and with one stroke of his paw dashed the nearest to the ground. The scene was terrific! There stood the lion with his foot upon his prostrate foe, looking round in conscious power and pride upon the bands of his assailants, and with a port the most noble and imposing that can be conceived. It was the most magnificent thing I ever witnessed. The danger of our friends, however, rendered it at the moment too terrible to enjoy either the grand or the ludicrous part of the picture. We expected every instant to see one or more of them torn in pieces; nor, though the rest of the party were standing within fifty paces with their guns cocked and levelled, durst we fire for their assistance. One was lying under the lion's paw, and the other

scrambling towards us in such a way as to intercept our aim at him. All this passed far more rapidly than I have described it. But, luckily, the lion, after steadily surveying us for a few seconds, seemed willing to be quits with us on fair terms; and with a fortunate forbearance (for which he met with but an ungrateful recompense), turned calmly away, and, driving the snarling dogs from beneath his heels, bounded over the adjoining thicket like a cat over a footstool, clearing brakes and bushes twelve or fifteen feet high as readily as if they had been tufts of grass, and, abandoning the jungle, retreated towards the mountains.

"After ascertaining the state of our rescued comrade (who fortunately had sustained no other injury than a slight scratch on the back and a severe bruise in the ribs, from the force with which the animal had dashed him to the ground), we renewed the chase with Hottentots and hounds in full cry. In a short time we again came up with the enemy, and found him standing at bay under an old mimosa-tree, by the side of a mountain-stream, which we had distinguished by the name of Douglas Water. The dogs were barking round, but afraid to approach him, for he was now beginning to growl fiercely, and to brandish his tail in a manner that showed he was meditating mischief. The Hottentots, by taking a circuit between him and the mountain, crossed the stream and took a position on the top of a precipice overlooking the spot where he stood. Another party of us occupied a position on the other side of the glen; and placing the poor fellow thus between two fires, which confused his attention and prevented his retreat, we kept batter-

ing away at him till he fell, unable again to grapple with us, pierced with many wounds.

"He proved to be a full-grown lion of the yellow variety, about five or six years of age. He measured nearly twelve feet from the nose to the tip of the tail. His foreleg below the knee was so thick that I could not span it with both hands; and his neck, breast, and limbs appeared, when the skin was taken off, a complete congeries of sinews."*

We have thus contemplated the lion as described by intelligent travellers and close observers; and we have seen the urgent necessity by which he is driven to the destruction of animal life, and the terrible powers by which he accomplishes that destruction. As the objects of his appetite, and the means which he employs for its gratification, are in themselves upon an ample scale, and thus fill the mind with an idea of great suffering inflicted by equal ferocity, so do we feel an instinctive shuddering in reading of herds put to flight; of some one trembling victim borne off to be torne to pieces by the beast in his lair; of man even suddenly deprived of existence by his desperate onset. Yet the same power and the same ferocity are constantly displayed before our eyes, though upon a smaller scale. The cat which springs upon the mouse is as formidable in its ability to injure, within its peculiar range, as the lion which carries away the antelope from his companions. The same instincts guide each to the same destruction of the lives of others of the animal creation. Throughout all nature we see the like necessities producing the

* Notes to Pringle's Ephemerides.

like effects; and those necessities have been considered to form part of the general design, which has thus established a sort of counterpoise to the power and preponderance of any one individual condition of existence. At any rate, we can have no doubt, from an examination of the physical structure of carnivorous animals, that in the destruction of life they fulfil the laws of their nature; and, however imperfectly we may understand the ends of those laws, we cannot be insensible to the perfection of the means by which they are carried into execution.

The invariable analogy between the teeth and the digestive organs of quadrupeds forms one of the most beautiful studies of Comparative Anatomy. The teeth that are made for tearing and cutting flesh, and fitted into jaws of great strength, incapable of lateral motion, but closing together like a pair of shears, are always accompanied with a stomach of less complicated structure than that which is fitted for the more difficult digestion of vegetable substances, particularly of grass, the most indigestible of all. In quadrupeds which devour their prey before absolute death has taken place, while the flesh is not yet set and the blood still warm, the stomach is of the most simple structure. In such animals, also, the intestines are much shorter than in those which feed entirely or partly on vegetables. For instance, in the lion, those intestinal parts which are called by anatomists the *colon* and *cœcum*, are three feet nine inches long; in the goat, a much smaller animal, they are twenty feet nine inches.* This simple stomach, and these

* Home, vol. i., p. 469.

short intestines are given to animals that are carnivorous, because the gastric juice of the stomach is sufficient for the purpose of digestion without any more complicated process. There is no doubt that, by habit, a carnivorous quadruped, a domestic cat for instance, may be brought to eat vegetable food; but an invariable preference will be given by it to flesh. Upon the same principle of natural preference, a young hawk, which is fitted by the construction of its stomach for eating flesh, will *cast* (as the falconers term it), that is, will bring up the contents of its stomach, if two or three oats are mingled with its meat. We see, therefore, that if the teeth of a lion or a panther were able to bruise grass, as those of the ruminating animals are, their stomachs would be incapable of digesting it; just in the same way that a sheep or a cow, if its teeth could tear flesh, would be rendered sick by eating that substance. To follow up the same mode of reasoning, the structure of the stomach of the lion being simpler than that of the hyæna, we have to inquire what difference this circumstance produces in their habits; and we find the difference to be, that the one prefers to seize a living body for its food, the other is attracted by a putrid carcass. In the formation of each animal we have principally to seek for the reason of its actions.

With these facts before us, we cannot doubt that, in the natural state of the lion, the tiger, the leopard, and other quadrupeds of the cat tribe, animal food is not only necessary to their existence, but that their principal faculties must be directed to the object of capturing that food. It would be

contrary to the evidence we have constantly before us of the completeness with which Nature works, to imagine that this ruling desire should be continually harassing the beast of prey, and that he should be provided with imperfect means for its gratification. An examination of the structure of the lion, with reference to the admirable mechanism by which he is enabled to preserve his existence, cannot fail to lead the mind to a conviction of the entire manifestation of design in this, as in every other work of the creation.

The lion, as we have seen, principally lives in the plains, and is always found where there are large herds of wild antelopes and quaggas feeding together, in that fellowship which is characteristic of each species. To all these animals he is an object of unceasing dread. It is supposed, by the agitation which oxen display when a lion is near them, that they can scent him at a considerable distance. Whatever may be his physical strength, therefore, and we know that it is prodigious, it is evident he could not accomplish his purposes by strength alone. The instinctive fear of the creatures upon which he preys would be constantly called into action by their keen sight and acute scent; and they would remove to some distan part before the destroyer could reach them. The lion, too, as well as the tiger, and others of the same species, seldom runs. He either walks or creeps, or, for a short distance, advances rapidly by great bounds.* It is evident, therefore, that he must seize his prey by stealth; that he is not fitted for an open attack; and that his character is

* Wilson's Illustrations of Zoology.

necessarily that of great power united to considerble wariness in its exercise.

Many are familiar with the roar of the lion. It is a sound of terror, and produces an appalling effect. It is said by travellers that it sometimes resembles the sound which is heard at the moment of an earthquake; and that he produces this extraordinary effect by laying his head upon the ground, and uttering a half-stifled growl, by which means the noise is conveyed along the earth.* The instant this roar is heard by the animals who are reposing in the plains, they start up with alarm; they fly in all directions; they rush into the very danger they seek to avoid. This fearful sound which the lion utters is produced by the great comparative size of the larynx,† the principal organ of voice in all animals.‡ He utters it to excite that fear which is necessary to his easy selection of an individual victim.

The lion, as well as all of the cat tribe, takes his prey at night; and it is necessary, therefore, that he should have peculiar organs of vision. In all those animals which seek their food in the dark, the eye is usually of a large size, to admit of a greater number of rays; and that part which is called the

* Burchell, vol. ii.

† That part of the throat which forms the upper part of the *trachea* (windpipe). It is composed of five cartilages. The protuberance of the larynx in the human subject is popularly called "Adam's apple."

‡ "The size of the larynx is proportionate to the strength of the sounds which the animals utter. The absolute size of the larynx of the whale and the elephant is the largest, but relatively the larynx of the lion has a still greater circumference."—Notes to Blumenbach's Comp. Anat., by Lawrence and Coulson. 1827.

choroides reflects, instead of absorbing, the light. The power of seeing in the dark, which the cat tribe possesses, has always appeared a subject of mystery; and it is natural that it should be so, for man himself sees with more difficulty in the dark than any other animal: he has a compensation in his ability to produce artificial light. There were formerly two opinions on the subject of the cat's eye: the one that the external light only is reflected, the other that light was generated in the eye itself. Professor Bohn, of Leipsic, made experiments, however, which proved that, when the external light is wholly excluded, none can be seen in the cat's eye; and it is now established that the illumination is wholly produced by the external rays of light, which, after being concentrated by those parts which are called the *cornea* and the *crystalline lens*, are reflected in a brilliant concave mirror at the bottom of the eye, called the *tapetum*.* This effect may be constantly seen in the domestic cat. In the strong light of day the *iris* is contracted, so that a very small quantity of light is admitted to this mirror; but in the twilight the *iris* opens, and then the mirror being completely exposed, the eye glares in the manner with which we are all familiar. The construction, therefore, of the eye of the cat tribe enables them to collect in one focus whatever rays of light there may be; and few places are so dark but that some light may be found; as we know, when we have gone into a cellar, where the darkness at first appears impenetrable, but where, even with our differently constructed organ of vision, we soon distinguish objects without

* See Home, vol. iii., p. 243.

difficulty. This peculiar eye, therefore, is necessary to the lion to perceive his prey; and he creeps towards it with a certainty which nothing but this distinct nocturnal vision could give.

Every one must have observed what are usually called the *whiskers* on a cat's upper lip. The use of these in a state of nature is very important. They are attached to a bed of close glands under the skin, and each of these long and stiff hairs is connected with the nerves of the lip.* The slightest contact of these whiskers with any surrounding object is thus felt most distinctly by the animal, although the hairs are themselves insensible. They stand out on each side in the lion as well as the common cat, so that, from point to point, they are equal to the width of the animal's body. If we imagine, therefore, a lion stealing through a covert of wood in an imperfect light, we shall at once see the use of these long hairs. They indicate to him, through the nicest feeling, any obstacle which may present itself to the passage of his body; they prevent the rustle of boughs and leaves, which would give warning to his prey if he were to attempt to pass through too close a bush; and thus, in conjunction with the soft cushions of his feet and the fur upon which he treads (the retractile claws never coming in contact with the ground), they enable him to move towards his victim with a stillness greater even than that of the snake that creeps along the grass, and not perceived till he has coiled round his prey.

We must carry our minds to the point when all these preliminary arrangements for bringing the

* Cuvier, Anat. Comp., Leçon xiv., Art. vi.

lion within reach of some devoted animal have been successful. The quagga is quietly listening for the sound of his scattered companions. At some twenty feet from him is the lion crouching and prepaing for the spring. The flexibility of his vertebral column allows him to throw himself upon his prey with prodigious swiftness, by the exercise of muscular power; and this power is so great, that the compression of the muscles upon the principal artery of the shoulder would produce a derangement of the animal's system, if that circumstance were not provided against by a most singular and beautiful expedient. The *os humeri* (the bone of the shoulder) is perforated in the lion tribe, to give a more direct course to the brachial artery, that it may not be compressed by the muscles when called into extraordinary action by the violence with which their prey is seized.* The muscles of the lion's fore-leg are unusually firm, and so are those of the thigh of a fighting cock.† This is a peculiar character of the muscles of animals whose habits are those of combat or of catching prey. Flexible as the joints of the larger species of the cat tribe are, they are knit together by the remarkable strength of the muscles; and no other provision would at once produce that pliancy and firmness which particularly characterize the limbs of the lion in the act of seizing his victim, and give both a grace and a power to all his ordinary movements.

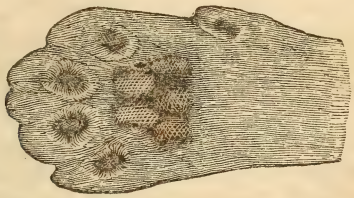
The weight of the lion's body, as compared with his size, is very remarkable; and this is produced by the extraordinary density of his muscles and

* Home, vol. i., p. 76. † Home, vol. i., p. 34.

the compactness of his principal bones. The force, therefore, with which he must alight after a bound of fifteen or twenty feet, must be obvious. The compensation against the jar produced by such a leap is remarkable. In the treatise on Animal Mechanics, in the Library of Useful Knowledge, it is shown how the number of bones in the human foot, arranged in a great number of joints, produces the elasticity which is required in its complicated movements. The lion's foot has nearly the same number of bones as the human, answering, of course, the same end.* But as the cat tribe are exposed, from their modes of life, to much more violent jars upon the foot than man, so are they furnished with a peculiar provision still farther to break the force of a fall or of a leap. In the domestic cat, we constantly observe the natural facility with which the tribe balance themselves when springing from a height; and this facility has given rise to the popular opinion that a cat will always fall upon its feet. The power of balancing themselves, whether leaping to or from an elevation, is in some degree produced by the flexibility of the heel, the bones of which have no fewer than six joints. But the softness with which the cat tribe alight on their feet arises from an admirable arrangement of that Wisdom which fits every creature for its peculiar habits. In the middle of the foot there is placed a large ball or pad, in five parts, formed of an elastic substance, intermediate in structure between cartilage and tendon; and at the base of each toe is a similar pad. It is impossible

* Home, vol. i., p. 125.

to imagine any mechanism more calculated to break the force of a fall.



The same mechanism has been discovered in several species of grasshoppers and locusts, whose habit of jumping is well known; and in which the structure is evidently for the purpose of taking off the jar, when the body of the insect is suddenly brought from a state of motion to a state of rest. In a species of *gryllus* brought from Abyssinia by Mr. Salt, the feet are made up of three joints: on the under surface of the first are three pairs of globular cushions, filled with an elastic fibrous substance, looser in its texture towards its circumference, which renders it more elastic; under the second joint is one pair of similar cushions; and under the last joint, immediately between the claws, is a large oval sucker.* This sucker is for the purpose of supporting the insect against gravity; a mechanism which the fly possesses.† A British species of grasshopper (*acryolium biguttulum*) has the same cushions and the same oval sucker as the grasshopper from Abyssinia. The following

* Home, vol. iii., p. 202.

† See Preliminary Treatise to the Library of Useful Knowledge.

engraving of the foot of this species is magnified two thousand five hundred times.

This similarity of structure, for similar purposes, in the lion and the grasshopper, offers a remarkable example of the uniformity of the contrivances of Nature, which, however different be the application, always attain the required end by the simplest means.

We have seen, in an extract from Mr. Burchell's travels, that when his dogs attacked a lion, two of them were killed by a very slight movement of the lion's paw. We must attribute this circumstance to the remarkable hardness of the bone of the fore-leg. The texture of this bone is so compact, for the purpose of resisting the powerful contraction of the muscles, that the substance will strike fire with steel.* This hardness is produced, according to the testimony of Mr. Hatchett, a distinguished chymist, by the degree of closeness of the fibres of which the bone is composed. From its extraordinary hardness, it was thought that the bone of the lion's fore-leg was of a peculiar chymical composition; but Mr. Hatchett has also shown that it only contains a larger proportion of phosphate of lime than is found in ordinary bones. Different bones of other animals vary also in their degree of compactness, and are hard in proportion to the weight which the bone is required to support, or

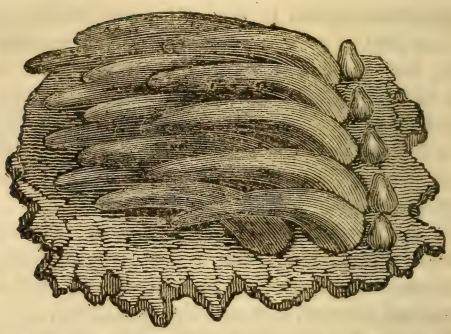
* Home, v., 354.

the exertion which it is destined to make. Thus the fore feet of a race-horse and of a deer are very small, but unusually hard. The hardness of the bone of the lion's foreleg is, therefore, not only necessary to bear the great muscular strain upon it, but it forms a powerful instrument of destruction. It will batter in a horse's scull as if it were a sledge-hammer.

The strength of the lion's jaws, the power of the muscles which move the lower jaw, and the construction of his teeth for tearing, cutting, and crushing animal matter, are popularly known.

There is one peculiar distinction of the lion, as well as of all his *congeners* (animals of the same family), which deserves a particular attention. The most obtuse sense of this branch of carnivorous quadrupeds is that of taste. According to Desmoulins, the lingual nerve of the lion is not larger than that of a middle-sized dog. The tongue of all animals of the cat kind is an organ of mastication as well as of taste. Observe a lion with a bone: whatever flesh his teeth leave on it is scraped away by the sharp and horny points, inclining backward, of his tongue. This circumstance would render it impossible that the lion, or any of the larger beasts of the same family, could lick the hand of a man, as we read in some fables, without tearing away the skin. The cut on the following page is a greatly magnified representation of a portion of the lion's tongue.

We have thus, somewhat more particularly than will be our usual practice, gone through several of the most striking peculiarities of the lion's structure. His conformation is evidently designed for

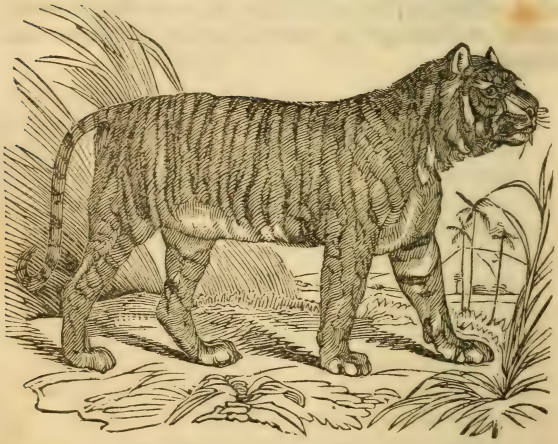


the destruction of animal life. We have noticed the roar by which he rouses his prey; the eye by which he sees it in the dark; the sensitive whiskers, and the cushioned foot, by which he creeps upon it without noise; the great physical force by which the spring upon the victim is performed, and the provision against any injury from the exercise of that force; the powerful instrument with which he strikes his prey, in itself most hard and massive, and armed with retractile claws; the teeth, the jaw, the prickly tongue, by which he is enabled to satisfy his appetite. All these properties form a part of the condition of his existence; and it should be borne in mind that the very nature of his food has a tendency to preserve his character unaltered; to support his enormous muscular strength; to perpetuate his sanguinary habits. The study of Comparative Anatomy, from which science we have collected this account of some of the peculiarities of the structure of the lion, constantly presents objects of similar interest. Galen, when studying human anatomy, was so struck with

the perfection with which all the parts of the human arm and hand are adapted to one another, that he composed a hymn to the Deity, expressing his admiration of a piece of so much excellence. The more we extend our researches into the animal kingdom, the more shall we be struck with this extraordinary adaptation of the parts of living bodies to their respective uses; the more shall we be convinced, by our own imperfect knowledge, of the perfection of that Wisdom and Power, whose works are as marvellous as they are unbounded.

CHAPTER VIII.

TIGER, LEOPARD, OCELOT, LYNX, PUMA, AND DOMESTIC CAT.



The Tiger. Felis tigris, LINNÆUS.

THE above is the portrait of a remarkably fine tiger, exhibited in 1829 at Atkins's Menagerie. This creature is particularly gentle, permitting liberties from its keepers which are not so often allowed by the tiger in captivity as by the lion. Nothing can be more beautiful than the power and freedom of its movements, or better indicate

that force and agility which have so long been the dread of the inhabitants of our Indian possessions.

The Tiger commonly called the Royal Tiger is a native of Bengal, the kingdoms of Siam and of Tonquin, of China, of Sumatra, indeed of all the countries of Southern Asia situated beyond the Indus and extending to the north of China. The species has long been most abundant in those countries; while the Asiatic lion, on the contrary, has only been known within a few years. The average height of the tiger is about three feet, and the length nearly six feet. The species, however, varies considerably in size; and individuals have often been found much taller and longer than the lion. The peculiar markings of the tiger's skin are well known. On a ground of yellow, of various shades in different specimens, there is a series of black transverse bars, varying in number from twenty to thirty, and becoming black rings on the tail, the number of which is, almost invariably, fifteen. There are oblique bands, also, on the legs. The pupils of the eye are circular.

Buffon has described the tiger, and so have many other naturalists, as a creature which, in comparison with the lion, deserves all the hatred of mankind, and none of their admiration. "To pride, courage, and strength, the lion joins greatness, clemency, and generosity; but the tiger is fierce without provocation, and cruel without necessity." Thus writes the most eloquent of naturalists, taking up prejudices instead of attending to facts, and using his real information for the support of a false theory. Similar in anatomical construction, the tiger

and the lion are similar in their habits; they are equally cats, driven by their conformation to the destruction of animal life. The tiger, perhaps, is somewhat more dangerous, for he has more activity than the lion; the clemency and generosity of both are doubtless equal. There is, however, this difference in their characters, which is in favour of the lion. He assists the female in rearing their young; the tiger deserts her. The tiger species will also destroy each other, and a female has been known to eat her cubs; but even this is not uncommon with the domestic cat. Redi says, describing a menagerie, "Among several curious foreign animals was a female tiger, with a cub a few months old in the same cage. This kind mother, upon coming towards Florence, whether out of sport or fury I will not undertake to say, seizing the cub in her teeth, broke its leg, and severed it from the joint. When she perceived the limb thus separated from the body, she devoured it most voraciously, although there was abundance of flesh in the cage besides." Yet the general affection of the tigress for her cubs cannot be doubted. Captain Williamson, in his work on "Oriental Field Sports," mentions that two tiger cubs were brought to him while stationed in the Ramghur district in India. They had been found, with two others, by some country people, during the absence of the mother. Being put in a stable, they made a loud noise for several nights, till at length the tigress arrived to their rescue, and replied to them by the most fearful howlings. The cubs were at last let loose, in apprehension that their mother would break in; and in the morning it was found that

she had carried them off to the neighbouring jungle.

As European civilization has advanced in India, the race of tigers, the scourge of the country, has gradually become less numerous. The Hindoos seldom voluntarily attempt to hunt the tiger, although he invades their houses and carries off their cattle, and very often the poor people themselves, whenever there is a village in the neighbourhood of an uncleared waste overgrown with reeds and bushes, called a jungle. The caste of Shecarries, whose business is hunting, are not numerous enough to accomplish this destruction effectually. The active courage of Europeans will generally remove the evil. Some years ago the island of Cossimbuzar was almost completely cleared of the tigers by a German named Paul, of great muscular strength and undaunted courage, who devoted himself to their extermination. This man is said to have shot five tigers in one day. His rifle never failed; and his success was such in this destruction of the scourge of the country, that the enormous overgrown wastes, which had almost been surrendered without a struggle to those ferocious creatures, were soon changed into fertile agricultural districts.

The tiger, like the lion, springs upon its prey from an ambush; and, in most cases, he is easily terrified by any sudden opposition from human beings. A party in India were once saved from a tiger by a lady opening an umbrella as she saw him about to spring. In narrow passes in Hindostan travellers have often been seized by tigers, or a bullock or horse has fallen a victim to the fe-

rocity of the prowling beast. Horses have such a dread of the tiger, that they can scarcely ever be brought to face him. Hunting him, therefore, on horseback is a service of great danger. The elephant, on the contrary, though considerably agitated, will stand more steadily while his rider anticipates the fatal spring by a shot which levels the tiger to the earth. One peculiarity of the tiger is his willingness to take to the water, either when pursued, or in search of the prey which he espies on the opposite bank of a river.

The late Bishop Heber, in his journal, has given a narrative of the mode in which a tiger hunt is conducted, full of picturesque effect, and striking from its minute detail:

"At Kulleanpoor, the young raja, Gourman Singh, mentioned in the course of conversation that there was a tiger in an adjoining tope which had done a good deal of mischief; that he should have gone after it himself had he not been ill, and had he not thought it would be a fine diversion for Mr. Boulderson, the collector of the district, and me. I told him I was no sportsman; but Mr. Boulderson's eyes sparkled at the name of tiger, and he expressed great anxiety to beat up his quarters in the afternoon. Under such circumstances, I did not like to deprive him of his sport, as he would not leave me by myself, and went, though with no intention of being more than a spectator. Mr. Boulderson, however, advised me to load my pistols for the sake of defence, and lent me a very fine double-barrelled gun for the same purpose. We set out a little after three on four elephants, with a servant behind each howdah, carrying a large chat-

ta, which, however, was almost needless. The raja, in spite of his fever, made his appearance too, saying that he could not bear to be left behind. A number of people, on foot and horseback, attended from our own camp and the neighbouring villages, and the same sort of interest and delight was evidently excited which might be produced in England by a great coursing party. The raja was on a little female elephant, hardly bigger than a Durham ox, and almost as shaggy as a poodle. She was a native of the neighbouring wood, where they are generally, though not always, of a smaller size than those of Bengal and Chittagong. He sat in a low howdah,* with two or three guns ranged beside him ready for action. Mr. Boulderson had also a formidable apparatus of muskets and fowling-pieces projecting over his mohout's head. We rode about two miles across a plain covered with long jungly grass, which very much put me in mind of the country near the Cuban. Quails and wild-fowl arose in great numbers, and beautiful antelopes were seen scudding away in all directions."

The bishop then describes the beating of the jungle, the rushing out of two curious animals of the elk kind, called the "mohr," and the growing anxiety of all the people engaged in the hunt. He then proceeds thus:

"At last the elephants all drew up their trunks into the air, began to roar, and stamp violently with their fore-feet. The raja's little elephant turned short round, and, in spite of all her mohout (her driver) could say or do, took up her post, to the raja's

* The howdah is a seat somewhat resembling the body of a gig, and is fastened by girths to the back of the elephant.

great annoyance, close in the rear of Mr. Boulderson. The other three (for one of my baggage elephants had come out too, the mohout, though unarmed, not caring to miss the show) went on slowly, but boldly, with their trunks raised, their ears expanded, and their sagacious little eyes bent intently forward. 'We are close upon him,' said Mr. Boulderson; 'fire where you see the long grass shake, if he rises before you.' Just at that moment my elephant stamped again violently. 'There, there,' cried the mohout, 'I saw his head.' A short roar, or, rather, loud growl followed, and I saw immediately before my elephant's head the motion of some large animal stealing through the grass. I fired as directed, and a moment after, seeing the motion still more plainly, fired the second barrel. Another short growl followed; the motion was immediately quickened, and was soon lost in the more distant jungle. Mr. Boulderson said, 'I should not wonder if you hit him that last time; at any rate, we shall drive him out of the cover, and then I will take care of him.' In fact, at that moment the crowd of horse and foot spectators at the jungle side began to run off in all directions. We went on to the place, but found it was a false alarm; and, in fact, we had seen all we were to see of him, and went twice more through the jungle in vain. * * * *

"I asked Mr. Boulderson, on our return, whether tiger-hunting was generally of this kind, which I could not help comparing to that chace of bubbles which enables us in England to pursue an otter. In a jungle, he answered, it must always be pretty much the same, inasmuch as, except under very

peculiar circumstances, or when a tiger felt himself severely wounded, and was roused to revenge by despair, his aim was to remain concealed, and to make off as quietly as possible. It was after he had broken cover, or when he found himself in a situation so as to be fairly at bay, that the serious part of the sport began, in which case he attacked his enemies boldly, and always died fighting. He added that the lion, though not so large or swift an animal as the tiger, was generally stronger and more courageous. Those which have been killed in India, instead of running away when pursued through a jungle, seldom seem to think its cover necessary at all. When they see their enemies approaching, they spring out to meet them, open-mouthed, in the plain, like the boldest of all animals, a mastiff dog. They are thus generally shot with very little trouble; but if they are missed or only slightly wounded, they are truly formidable enemies. Though not swift, they leap with vast strength and violence; and their large heads, immense paws, and the great weight of their body forward, often enable them to spring on the head of the largest elephants, and fairly pull them down to the ground, riders and all. When a tiger springs on an elephant, the latter is generally able to shake him off under his feet, and then wo be to him. The elephant either kneels on him and crushes him at once, or gives him a kick which breaks half his ribs, and sends him flying perhaps twenty paces. The elephants, however, are often dreadfully torn; and a large old tiger sometimes clings too fast to be thus dealt with. In this case it often happens that the elephant himself falls, from pain or from

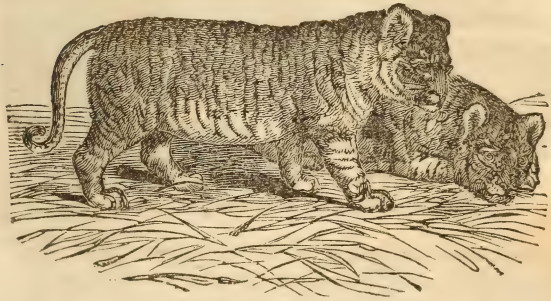
the hope of rolling on his enemy; and the people on his back are in very considerable danger, both from friends and foes; for Mr. Boulderson said the scratch of a tiger was sometimes venomous, as that of a cat is said to be. But this did not often happen; and, in general, persons wounded by his teeth or claws, if not killed outright, recovered easily enough."

There appears to be no greater difficulty in rendering the tiger docile than the lion. As the sovereign of Persia has his tame lions, so have the faquirs, or mendicant priests of Hindostan, their tame tigers. These will accompany them in their walks, and remain, without attempting to escape, in the neighbourhood of their huts. The tigers in menageries appear, with a few exceptions, to be ordinarily under as complete control as the species which, for so long a time, has been supposed to possess all the generous virtues of the *genus felis*.

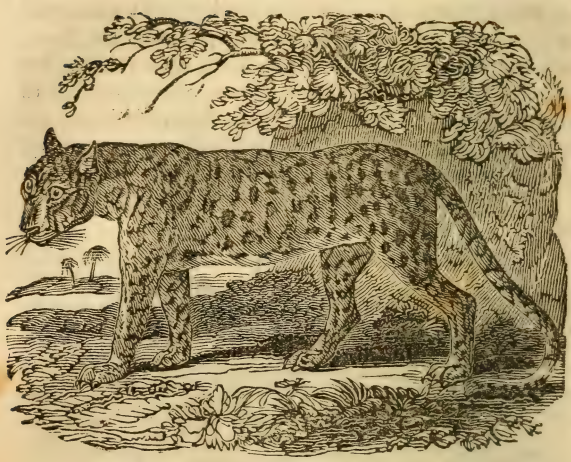
Several keepers of menageries during the last few years have succeeded in obtaining a mixed breed between the lion and the tiger. Mr. Atkins has exhibited cubs, produced at various times, by the union of the lion with the tigress. In September, 1828, we saw two lion-tiger cubs in his exhibition, which had been whelped at Edinburgh on the 31st of December, 1827. Their general colour was not so bright as that of the tiger species, and the transverse bands were rather more obscure. The little animals were very playful, and the mother was most tractable, suffering the keeper to enter the den and exhibit her cubs to the spectators.

In the autumn of 1829 this tigress was exhibited in the same den with her cubs and with the lion; and the wonder of every spectator was excited by the gentleness of the whole group, who clustered in fondness round the keeper, and displayed their extraordinary power of leaping, with the readiest obedience to his commands.

The tigress produces three or four cubs at a litter.



Lion-Tiger Cubs.



The Leopard. Felis Leopardus, LINNÆUS.

The average length of the leopard is under four feet, and his height is about two feet. The general colour of his skin and the arrangement of the spots are exceedingly beautiful. The yellowish fawn ground, which gradually becomes a perfect white on the under parts of the body, is covered with black spots, of a round or oval form, on the head, neck, limbs, and back; while on the sides and part of the tail the spots unite in ten ranges of distinct roses, surrounding a central area of a somewhat deeper colour than the general ground. In the *Panther* there are only six or seven ranges of these roses.

The natural habits of the leopard, like those of all the cat tribe, are compounded of ferocity and

cunning. He preys upon the smaller animals, such as antelopes, sheep, and monkeys; and he is enabled to secure his food with great success, from the extraordinary flexibility of his body. The leopards in the Tower of London, who have a tolerably large cage, bound about with the quickness of a squirrel, so that the eye can hardly follow their movements. In Africa they are sometimes found of extraordinary size and rapacity. Their relative size principally distinguishes the leopard and the panther, the latter being ordinarily the larger. M. Cuvier considers them distinct species, although they are doubtless often mistaken by travellers, from their great similarity.

We have been favoured, by a gentleman who was formerly in the civil service at Ceylon, with the following description of an encounter with a leopard or panther, which in India are popularly called tigers:

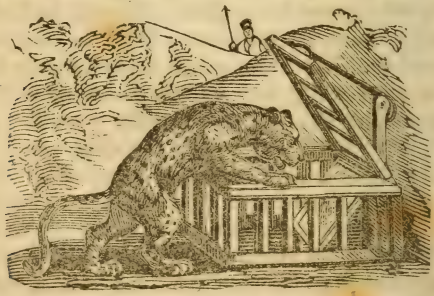
"I was at Jaffna, at the northern extremity of the island of Ceylon, in the beginning of the year 1819, when, one morning, my servant called me an hour or two before my usual time, with 'Master, master! people sent for master's dogs; tiger in the town!' Now my dogs chanced to be some very degenerate specimens of a fine species called the *Poligar* dog, which I should designate as a sort of wiry-haired greyhound, without scent. I kept them to hunt jackals; but tigers are very different things; by-the-way, there are no real tigers in Ceylon; but leopards and panthers are always called so, and by ourselves as well as by the natives. This turned out to be a panther. My gun chanced not to be put together; and while my servant was doing it,

the collector and two medical men, who had recently arrived, in consequence of the cholera morbus having just then reached Ceylon from the Continent, came to my door, the former armed with a fowling-piece, and the two latter with remarkably blunt hog-spears. They insisted upon setting off without waiting for my gun, a proceeding not much to my taste. The tiger (I must continue to call him so) had taken refuge in a hut, the roof of which, as those of Ceylon huts in general, spread to the ground like an umbrella; the only aperture into it was a small door about four feet high. The collector wanted to get the tiger out at once. I begged to wait for my gun; but no, the fowling-piece (loaded with ball, of course) and the two hog-spears were quite enough. I got a hedge-stake, and awaited my fate from very shame. At this moment, to my great delight, there arrived from the fort an English officer, two artillerymen, and a Malay captain; and a pretty figure we should have cut without them, as the event will show. I was now quite ready to attack, and my gun came a minute afterward. The whole scene which follows took place within an enclosure, about twenty feet square, formed on three sides by a strong fence of palmyra leaves, and on the fourth by the hut. At the door of this the two artillerymen planted themselves; and the Malay captain got at the top, to frighten the tiger out by unroofing it; an easy operation, as the huts there are covered with cocoanut leaves. One of the artillerymen wanted to go in to the tiger, but we would not suffer it. At last the beast sprang; this man received him on his bayonet, which he thrust apparently down his throat, firing

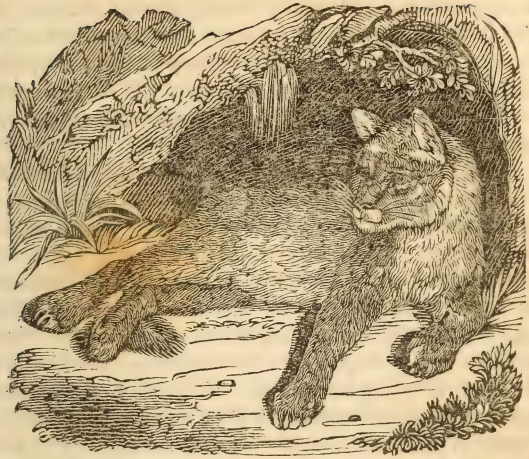
his piece at the same moment. The bayonet broke off short, leaving less than three inches on the musket; the rest remained in the animal, but was invisible to us: the shot probably went through his cheek, for it certainly did not seriously injure him, as he instantly rose upon his legs, with a loud roar, and placed his paws upon the soldier's breast. At this moment the animal appeared to me to about reach the centre of the man's face; but I had scarcely time to observe this, when the tiger, stooping his head, seized the soldier's arm in his mouth, turned him half round, staggering, threw him over on his back, and fell upon him. Our dread now was, that if we fired upon the tiger we might kill the man: for a moment there was a pause, when his comrade attacked the beast exactly in the same manner as the gallant fellow himself had done. He struck his bayonet into his head; the tiger rose at him; he fired; and this time the ball took effect, and in the head. The animal staggered backward, and we all poured in our fire. He still kicked and writhed; when the gentlemen with the hog-spears advanced and fixed him, while some natives finished him by beating him on the head with hedge-stakes. The brave artilleryman was, after all, but slightly hurt: he claimed the skin, which was very cheerfully given to him. There was, however, a cry among the natives that the head should be cut off: it was; and, in so doing, *the knife came directly across the bayonet.* The animal measured scarcely less than four feet from the root of the tail to the muzzle."

The leopard of India is called by the natives the "tree tiger," from its habit of ascending a tree

when pursued, or for the purpose of enabling it to spring securely on its prey. It is doubtless able to effect this ascent by the extraordinary flexibility of its limbs, which give it the power of springing upward; for, in the construction of the feet, it has no greater facilities for climbing than the lion or the tiger. It cannot clasp a branch like the bear, because the bone called the *clavicle* is not sufficiently large to permit this action. The Indian hunters chase the leopard to a tree: but even in this elevated spot it is a task of great difficulty to shoot him; for the extraordinary quickness of the creature enables him to protect himself by the most rapid movements. The Africans catch this species in pitfalls, covered over with slight hurdles, upon which there is placed a bait. In some old writers on Natural History there are accounts of the leopard being taken in a trap by means of a mirror, which, when the animal jumps against it, brings down the door upon him. This story may have



received some sanction from the disposition of the domestic cat, when young, to survey her figure in a looking-glass.



Puma. Felis concolor, LINNÆUS.

The puma is a native of the New World, and is principally found in Paraguay, Brazil, and Guiana. He is, however, often seen in the United States; but there, as in every other part of the world, civilization daily lessens the range of those animals which live by the destruction of others. The puma, in its natural state, is a sanguinary creature, attacking the smaller quadrupeds, and often destroying more than can be necessary for the satisfaction of his appetite. He is alarmed at the approach of men or of dogs, and flies to the woods, where he mounts trees with great ease. He belongs to the same division of cats as the lion, by the essential

character of the unspotted colour of his skin, which is of a reddish-yellow or silvery-fawn; but, unlike the lion, he is without a mane, and the tail has no tuft. The average length of the puma is about four feet, and its height about two feet. It stands lower on the legs than the lion, and the head is round and small.

The puma, which was long called the American lion, though a large animal, is not an object of great dread to the natives of the regions to which he belongs. He is easily tamed. D'Azara, the naturalist, had one which was as sensible to caresses as the common cat; and Mr. Kean, the tragedian, had a domesticated puma, which was much attached to him. Although there have been instances of the puma attacking and even destroying the human species, in South America they have an instinctive dread of any encounter of this nature. Captain Head, in his "Journey across the Pampas," has the following interesting anecdote of the puma, which, in common with other travellers, he incorrectly calls the lion:

"The fear which all wild animals in America have of man, is very singularly seen in the Pampas. I often rode towards the ostriches and zamas, crouching under the opposite side of my horse's neck; but I always found that, although they would allow any loose horse to approach them, they, even when young, ran from me, though little of my figure was visible; and when one saw them all enjoying themselves in such full liberty, it was at first not pleasing to observe that one's appearance was everywhere a signal to them that they should fly from their enemy. Yet it is by this fear that 'man

hath dominion over the beasts of the field,' and there is no animal in South America that does not acknowledge this instinctive feeling. As a singular proof of the above, and of the difference between the wild beasts of America and of the Old World, I will venture to relate a circumstance which a man sincerely assured me had happened to him in South America.

"He was trying to shoot some wild ducks, and, in order to approach them unperceived, he put the corner of his poncho (which is a sort of long narrow blanket) over his head, and crawling along the ground upon his hands and knees, the poncho not only covered his body, but trailed along the ground behind him. As he was thus creeping by a large bush of reeds, he heard a loud, sudden noise between a bark and a roar: he felt something heavy strike his feet, and, instantly jumping up, he saw, to his astonishment, a large lion actually standing on his poncho; and perhaps the animal was equally astonished to find himself in the immediate presence of so athletic a man. The man told me he was unwilling to fire, as his gun was loaded with very small shot; and he therefore remained motionless, the lion standing on his poncho for many seconds: at last the creature turned his head, and walking very slowly away about ten yards, he stopped and turned again: the man still maintained his ground, upon which the lion tacitly acknowledged his supremacy and walked off."

We have thus described the structure and appearance, and traced the habits of several species of the cat tribe; and have particularly seen that the invariable characteristic of the race—of whatever

form, of whatever colour, of whatever physical power the individual variety may be—is a ruling desire for the destruction of animal life. In some species this desire is carried into action with more boldness, in others with more cunning; but in all there is a mixture of cunning and boldness, more or less mingled with a suspicion which assumes the appearance of fear, the unchanging property of all treacherous natures. The creature which lies at our fireside, leaps upon our table, sits upon our knee, purs round our legs, attends us at our meals, never forsakes our houses, and altogether appears as if it could only exist in dependance upon man—the domestic cat—is precisely of the same nature as the leopard or the puma. In this case, unlike that of the dog, there is no doubt which is the original head of the domesticated stock. The wild cat of the European forests is the tame cat of the European houses; the tame cat would become wild if turned into the woods; the wild cat at some period has been domesticated, and its species has been established in almost every family of the old and new continent.

The domestic cat has been multiplied with the multiplication of the small noxious animals that follow the progress of civilization. As man erects houses, these animals seek therein shelter and food. Without the cat, this would have been, and would still be, a most serious evil. The fecundity of mice would make them the most troublesome inmates of a family; and their attacks upon every eatable substance would cause a great diminution of the produce of human industry. It would be difficult to trace the period when the wild cat was first brought

from the woods, where it preys upon the birds, and fieldmice, and leverets, and young rabbits, with as much avidity as the lion hunts after antelopes and oxen. But there must have been a period when it first occurred to man that the instincts of this animal might be subdued to his uses. In the ruder ages of society—in the tenth and eleventh centuries, for instance—we find domestic cats very scarce; and laws were then passed against their mutilation, and other regulations made, which show the importance attached to their preservation. In the Collection of Welsh Statutes (*Leges Walliæ*) may be found the value of a cat of every age, and of each degree of adroitness and vigour. The passion for animal food, or, rather, the desire to destroy a living animal, is the quality which makes the cat valuable to man. Domestication does not extinguish the passion; for the pampered inmate of the parlour does not forget its nightly prowl through every part of a house where mice can come; and the consequence is, that we are, to a great degree, unmolested by these troublesome visiters, who would be quite as offensive, though not so dangerous, as the numberless varieties of ferocious creatures which the dog has so materially assisted us in subduing or exterminating.

The wild cat (*felus catus*) is much about the size of the ordinary cat; and is of a gray colour, marked with black stripes, longitudinal on the back, and transverse on the flanks; the lips and soles of the feet black; the tail marked with rings, with a black tip. The domestic cat (*felis catus domesticus*) has no essential external variation from the wild stock, except, perhaps, in the great brilliancy of its col-

ours. The lips and the soles of the feet are also constantly black, as well as the end of the tail. There is, however, this peculiarity in the domestic species; it is not entirely carnivorous, for it will readily eat bread and other vegetable matter: and, following up the constant analogy between habit and structure, we find the intestines of the tame proportionably longer than those of the wild variety. Domestic cats, too, will devour insects. Quadrupeds seldom prey upon insects, although the anteater is an exception, as well as the mole; and the common hedgehog has lately been domesticated in London, for the more complete destruction of black beetles than can be effected by cats or traps of glass.

It would be a singular inquiry, though somewhat difficult, to ascertain what qualities the cat has lost by domestication, and what it has acquired. Some of its instincts appear perfect as in the natural state, some more matured, and some nearly subdued. The same cruelty belongs to the domestic cat as the wild; that instinct is never subdued. But the range of its food is limited by its hereditary habits of domestication. There is no doubt that wild cats will seize on fish; and the passionate longing of the domestic cat after that food is an evidence of the natural desire. We have seen a cat overcome her habitual reluctance to wet her feet, and seize an eel out of a pail of water. Dr. Darwin alludes to this propensity: "Mr. Leonard, a very intelligent friend of mine, saw a cat catch a trout by darting upon it in a deep clear water, at the mill at Weaford, near Lichfield. The cat belonged to Mr. Stanley, who had often seen her catch fish in

the same manner in summer, when the millpool was drawn so low that the fish could be seen. I have heard of other cats taking fish in shallow water as they stood on the bank. This seems to be a natural method of taking their prey, usually lost by domestication, though they all retain a strong relish for fish." Some of their instincts are unchanged by domestication, although they have ceased to be of use ; and a habit of reasoning does not so completely become mixed with the instinct as in the dog.

The ability of cats to seize upon their ordinary prey, mice or birds, does not appear to lose anything by domestication. The extraordinary patience with which a cat will watch a mousehole for hours, is doubtless a natural property. This determined bending of the will to one object is probably a principal cause of the fascination which some serpents possess. In a very agreeable book recently published, "The Journal of a Naturalist," we find several instances of this power being exercised by hawks upon smaller birds. The author of that journal says, "There can be no doubt of the fact that instinctive terror will subdue the powers of some creatures, rendering them stupified and motionless at the sudden approach of danger. Cats, in some degree, are supposed to possess this power of terrifying their prey. Montaigne gives a story illustrative of the notion :

"There was at my house, a little while ago, a cat seen watching a bird upon the top of a tree, and for some time they mutually fixed their eyes upon each other. At length the bird let herself fall dead into the cat's claws, either dazzled and as-

tonished by the force of imagination, or drawn by some attractive power in the cat. This is similar to the story told of the falconer, who, having earnestly fixed his eyes upon a kite in the air, laid a wager that he would bring her down by the power of sight alone, and succeeded, as it was said; for, when I borrow a tale of this kind, I charge it upon the conscience of those from whom I have it."* There is no doubt that a mouse will sometimes suddenly yield itself to the power of its enemy. Montaigne very properly doubts the story of the falconer; though the human eye has certainly great power, particularly in warding off the attack of a dog or a cow.

One of the most remarkable properties of a domestic cat is the anxiety with which it makes itself acquainted, not only with every part of its usual habitation, but with the dimensions and external qualities of every object by which it is surrounded. Cats do not very readily adapt themselves to a change of houses; but we have watched the process by which one, whose attachment to a family is considerable, reconciles itself to such a change. He surveys every room in the house, from the garret to the cellar; if a door is shut, he waits till it be opened to complete the survey; he ascertains the relative size and position of every article of furniture; and when he has acquired this knowledge, he sits down contented with his new situation. It appears necessary to a cat that he should be intimately acquainted with every circumstance of his position, in the same way that a general first examines the face of the country in which he is to conduct his

* Essays, i., 20.

operations. If a new piece of furniture, if even a large book or portfolio, is newly placed in a room which a cat frequents, he walks round it, smells it, takes note of its size and appearance, and then never troubles himself farther about the matter. This is, probably, an instinctive quality; and the wild cat may, in the same way, take a survey of every tree or stone, every gap in a brake, every path in a thicket, within the ordinary range of its operations. The whiskers of the cat, as we have mentioned in the case of the lion, enable it to ascertain the space through which its body may pass, without the inconvenience of vainly attempting such a passage.

The memory of a cat must be very strong, to enable it to understand this great variety of *local* circumstances after a single observation. The same power of memory leads this animal, much as its affection may be doubted, to know the faces of individuals. We have seen a cat exhibit manifest delight upon the return of its master, or of a person from whom it had received peculiar kindness. There are several instances of strong attachment to the human race in cats, though in number and intensity they fall far short of the attachment of the dog. They have sometimes, also, great affection to other animals, which becomes a reciprocal feeling. The celebrated horse, the Godolphin Arabian, and a black cat, were for many years the warmest friends. When the horse died in 1753, the cat sat upon his carcass till it was put under ground; and then, crawling slowly and reluctantly away, was never seen again till her dead body was found in a hayloft.* Stubbs painted the portraits

* Lawrence's History of the Horse, p. 109.

of the Arabian and the cat. There was a hunter in the king's stables at Windsor, to which a cat was so attached, that, whenever he was in the stable, the creature would never leave her usual seat upon the horse's back; and the horse was so well pleased with the attention, that, to accommodate his friend, he slept, as horses will sometimes do, standing. This, however, was found to injure his health, and the cat was removed to a distant part of the country.

The attachment of domestic cats to human individuals is by no means universal with the species, nor, indeed, is it very common. The cat, to a certain extent, knows the voice and person of its master; and, what is singular, cats have antipathies to particular individuals. The effects of discipline upon the cat are very inferior to the influence of chastisement or caresses upon the dog. The dog, when he is beaten or reproved for a particular offence, seldom repeats it; the cat, as far as we have seen, can never be prevented importuning for food; jumping upon you, sitting in your chair, clambering upon a table, tearing furniture, scratching up plants, however constantly it may be beaten for these annoyances. Cats may be taught to perform tricks, such as leaping over a stick, but they always do such feats unwillingly. There is an exhibition of cats in London, where the animals, at the bidding of their master, an Italian, turn a wheel, draw up a bucket, ring a bell, and in doing these things, begin, continue, and stop as they are commanded. But the *begin*, *continue*, *stop* of their keeper is always enforced with a threatening eye, and often with a severe blow; and the poor crea-

tures exhibit the greatest reluctance to proceed with their unnatural employments. They have a subdued and piteous look; but the scratches upon their master's arms show that *his* task is not always an easy one.

A strong affection for her young ordinarily prevails in the female cat; and the feeling has sometimes produced an unusual foresight. The following fact is mentioned to us as having recently occurred. A short time before a cat produced kittens, she was observed to hoard up several mice and young rats, which she did not quite kill, but lamed, so as to prevent their escaping. One day, after dinner, when our informant was sitting with a friend, the cat bounced into the room in eager chase of one of her maimed prisoners; a young rat, which had, as it appeared from the report of the servants, been some days under surveillance in a back court. The rat sprung up the window-curtain for safety; but, being unable to retain its position, was soon recaptured. This was a refinement of cruelty which peculiarly marks the species; it was carrying the odious habit of torturing its prey, which is characteristic of the cat, to a disgusting extent.

It is by no means uncommon among the insect tribes to secure live prey for their future offspring. The ichneumon fly, for example, lays its eggs in the body of a live caterpillar, and the larvæ thence produced feed on it without killing it, till their transformation into pupæ. The *sphex* also, or sand-wasp, when it makes a nest, encloses in it a supply of live grubs, proportioned to the wants of the future offspring. The circumstances respecting the

cat (which was verified in several instances) would not have been so remarkable had it occurred *after* she had had kittens; but the prospective provision, whether for her own or their subsistence, is well worthy of notice. The same strength of maternal feeling sometimes induces cats which have lost their kittens to continue for a week or two to bring mice and other provision to their bed, in expectation of the return of the kittens. A gentleman informed us, that more than a fortnight after his cat had been deprived of her kittens, she came in with a mouse, and searched all over the house for them with the prey, making a complaining noise.

These circumstances, which indicate the desire which the female cat has for the preservation of her young, are not incompatible with the well-known fact of her rearing the young of other animals. The exercise of the maternal duties is always a strong gratification; and it is not, therefore, wonderful that if the opportunity is suddenly withdrawn, the desire should adapt itself to any accidental means of satisfaction, however strange. We have many instances of this. Mr. White gives two well-known examples in his history of Selborne, of a cat supporting a leveret and squirrels; and Dr. Darwin has the following account of a similar circumstance: "At Elford, near Lichfield, the Rev. Mr. Sawley had taken the young ones out of a hare which had been shot. They were alive; and his cat, which had just lost her own kittens, carried them away, as it was supposed, to eat them; but it presently appeared that it was affection, not hunger, which incited her, as she suckled them and brought them up as their mother."

The following anecdote, of a similar nature, has been communicated to us upon authority which we cannot doubt: A cat and a bitch, belonging to a lady, chanced to have young at the same time. The cat, not liking the place assigned her for her kittens, carried them, without having been perceived, into a drawer containing clothes, which was soon afterward pushed in, and the kittens imprisoned in it. In the mean while, the bitch, having gone out of doors, was either stolen or killed, as she never returned to her pups. These were found out and adopted by the cat. A day or two after this singular adoption, the kittens were discovered in the drawer, so nearly starved that they all died, except one, within a week. The cat, however, continued to nurse both this one and her adopted pups till they were full grown.

One of the most remarkable peculiarities of the domestic cat is the property which its fur possesses of yielding electric sparks by rubbing. In frosty weather this is occasionally very extraordinary. During the severe cold of January last, we several times received a very acute electrical sensation upon merely touching a large black cat lying before a fire. Mr. White says, speaking of the frost of 1785, "during these two Siberian days, my parlour cat was so electric, that, had a person stroked her and been properly insulated, the shock might have been given to a whole circle of people."

It is a very prevalent notion that cats are fond of sucking the breath of infants, and, consequently, of producing disease and death. Upon the slightest reflection, nothing can be more obvious than that it is impossible for cats to suck an infant's breath,

at least so as to do it any injury; for even on the supposition that they did so, the construction of their mouth must preclude them from interrupting the process of breathing by the mouth and the nose at the same time. The vulgar notion must have arisen from cats nestling about infants in beds and cradles to procure warmth. Cats are particularly solicitous to be comfortably placed as to temperature. In winter they get before the fire to sleep; in summer they seek the shade of a tree, where the air is fresh and cooling.

The cat ordinarily breeds thrice in a year, and goes with young fifty-five or fifty-six days. She brings forth four or five kittens, which she nourishes for some weeks with great care. The average duration of a cat's life is about fifteen years.

The following is the scientific character of the carnivorous *genus Felis*, which is found in Europe, Asia, Africa, and America, but which has not yet been recognised in Australasia:

Arrangement of the teeth:

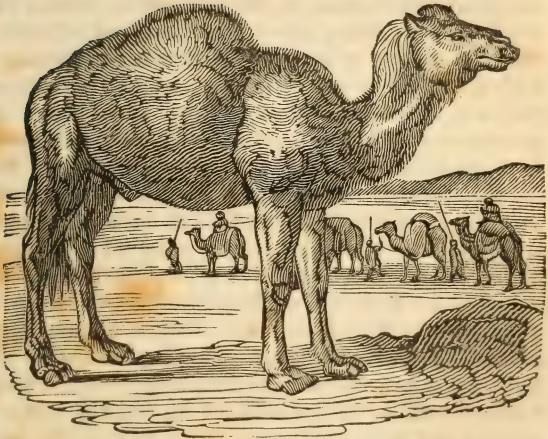
Incisors, $\frac{6}{6}$, Canine, $\frac{1-1}{1-1}$, Molar, $\frac{4-4}{3-3}$, or $\frac{3-3}{3-3}$.

Total, 30, or 28.

The head round; the tongue covered with sharp prickles, pointing backward; the ears pointed; the pupils of the eye sometimes contracting in a vertical line, sometimes in a circle; three toes on the hind feet, and four on the front, each armed with a retractile claw, which is *completely* retractile on the fore feet.

CHAPTER VIII.

THE CAMEL.



The Arabian Camel. Camelus Dromedarius, LINNÆUS.—*Dromedaire*, BUFFON *et* G. CUVIER.

THE camel has been created with an especial adaptation to the region wherein it has contributed to the comfort, and even to the very existence of man, from the earliest ages. It is constituted to endure the severest hardships with little physical inconvenience. Its feet are formed to tread lightly upon a dry and shifting soil; its nostrils have the

capacity of closing, so as to shut out the driving sand when the whirlwind scatters it over the desert; it is provided with a peculiar apparatus for retaining water in its stomach, so that it can march from well to well without great inconvenience, although they be several hundred miles apart. And thus, when a company of eastern merchants cross from Aleppo to Bussorah, over a plain of sand, which offers no refreshment to the exhausted senses, the whole journey being about eight hundred miles, the camel of the heavy caravan moves cheerfully along, with a burden of six or seven hundred weight, at the rate of twenty miles a day; while those of greater speed, that carry a man without much other load, go forward at double that pace and daily distance. Patient under his duties, he kneels down at the command of his driver, and rises up cheerfully with his load; he requires no whip or spur during his monotonous march; but, like many other animals, he feels an evident pleasure in musical sounds; and, therefore, when fatigue comes upon him, the driver sings some cheering snatch of his Arabian melodies, and the delighted creature toils forward with a brisker step till the hour of rest arrives, when he again kneels down to have his load removed for a little while; and, if the stock of food be not exhausted, he is farther rewarded with a few mouthfuls of the cake of barley which he carries for the sustenance of his master and himself. Under a burning sun, upon an arid soil, enduring great fatigue, sometimes without food for days, and seldom completely slacking his thirst more than once during a progress of several hundred miles, the camel is patient, and apparently happy. He ordi-

narily lives to a great age, and is seldom visited by any disease. And why is this? He lives according to his peculiar nature; while with us, as we sometimes see him in our streets, his nature is outraged even by the greater care taken to provide for what are considered his physical wants.

The camel with one hump, which we ordinarily call the dromedary, has been reared at one place in Europe for two centuries; this place is Pisa in Italy. His habits are there, to a certain extent, the same as in his native region; but the soil and climate of Europe are ill adapted to his organization. The camels of Pisa have degenerated; they are weaker than those of the East; and their lives are of comparatively short duration. This circumstance is a convincing proof that the natural locality of the camel is an arid and thirsty region, offering little vegetable food, and that little of the coarsest kind. That region comprises Arabia, all the northern district of Africa, which extends in length from Egypt to Mauritania, and in breadth from the Mediterranean Sea to the River Senegal; Egypt, Abyssinia, Persia, Southern Tartary, and parts of India. Over this extensive region is the camel spread; and here he has formed the best possession of the people from the time of the patriarchs. He is called *Djemal* by the Arabs, and *Gamal* by the Hebrews. The Bactrian camel with two humps is much more rare; and this species is principally found in Turkistan, which is the ancient Bactri, and in Thibet, as far as the frontiers of China.

The accounts of the natural history of the camel, and especially of its habits, which we find in east-

ern travellers, are somewhat vague; and this is to be ascribed to the extraordinary abundance in which the animal is found. The naturalist or man of letters, who travels with a caravan consisting of many hundred camels, is struck with the general effect of objects so new and so extraordinary, without inquiring into the details of their individual peculiarities. In the same way, if a foreigner who had never seen a horse were brought to London, his imagination would be impressed by the vast number and the beauty of these animals when employed by the wealthy and luxurious; by their great strength and usefulness when drawing the heavy wagons of commerce; and perhaps by their wretched appearance when, as is too often the case, worn out with service, they drag on a painful existence in humbler employments, ill fed, beaten, exposed to every change of the seasons, and tasked beyond their strength. But he would learn little of the personal history of these horses, of their peculiarities of breed, of their modes of nourishment, of their training, of their sagacity, of their generous courage, of their affection to their masters. Much of this sort of individual anecdote we want in the general accounts of the camel; though, by comparing various slight and incidental notices of travellers in Asia and Africa, we may be able to collect many curious and valuable particulars of the habits of the animal.

The camel with one hump is distinguished by naturalists as the *camelus dromedarius*. The term dromedary properly applies to a very swift species of camel. The name of *καμηλος δρομας* (fleet camel) was given by Strabo and Diodorus Siculus

to a single race of the species, of great speed, now called by the Arabs *el heirie*. Obtaining the word dromedary from *dromas*, we have popularly, and even scientifically, applied it to the species. A dromedary is to a camel what a racer is to a horse of burden. There are one-humped and two-humped dromedaries, and one-humped and two-humped camels.

The lean and almost fleshless body of the camel is covered with hair, which is very short on the forepart of the muzzle: this becomes longer on the top of the head, and almost tufty on the neck and parts of the fore legs, on the back, and particularly on the hump, which it covers all over. The tail is also thick with hair, which extends considerably beyond the vertebræ. The colour of the hair varies: it is either white, with a slight tint of rose-colour, gray, bay, or dark brown approaching to black. The hair falls off, and is renewed every year about the end of spring and the commencement of summer.

M. Santi has described the peculiar excitation of the camel for about two months of the year, February and March. During this period these patient and gentle creatures, particularly the male, become restless and ferocious; will bite their keepers; and fight among themselves with their teeth and feet.

The female camel goes with young between eleven and twelve months, at the end of which time she has one foal.

Of the mode of breaking and training the camel by the people of the East, we have no complete account. M. Santi supplies this information with

regard to those of Tuscany. At the age of four years, a camel which is intended for labour is broken in. The trainers first double up one of his fore legs, which they tie fast with a cord; they then pull the cord, and thus usually compel the animal to fall upon his bent knee. If this does not succeed, they tie up both legs, and he falls upon both knees, and upon the callosity which is upon his breast. They often accompany this operation with a particular cry, and with a slight blow of a whip. At this cry and blow, with the addition of a sudden jerk downward of his halter, the camel gradually learns to lie down upon his belly, with his legs doubled under him, at the command of his driver. The trainers then accustom him to a pack-saddle, and place on it a load, at first light, but increased by degrees as the animal increases in docility; till at last, when he readily lies down at the voice of his driver, and as readily rises up with his load, his education is so far complete. The burden of a full-grown camel is sometimes four hundred kilogrammes (above 800 lbs.); but such a load, if we may judge by other accounts, is excessive.

He is accustomed, in the same gradual manner, to allow his driver to mount, and to obey all his orders, and even his motions, in the direction of his course. M. Santi says, that it is neither a tedious nor a difficult task thus to subdue an animal of a timid and gentle nature, without defence, and whose spirit has been broken by a long course of slavery. The camel is sometimes oppressed by the loads which are placed upon him when he is kneeling before his driver, and he expresses his

displeasure. M. Denon, who travelled in Egypt during the expedition of Napoleon, and published a splendid work illustrative of the manners and antiquities of the country, has given us a spirited sketch of a camel thus suffering and irritated. "He cries out," says M. Denon, "when he is either laden too heavily or laden unequally. This good animal complains only of injustice, and then it must be extreme for him to complain at all."

The camel has seven callosities, upon which he throws the weight of his body, both in kneeling down and rising up. These consist of one on the breast, two on each of the fore legs, and one on each of the hind. He sleeps always with his knees bent under his body and his breast upon the ground. Some naturalists have contended that these callosities are produced by the constant friction to which the parts are exposed upon which they grow, in the same way that a tight shoe will produce a corn. M. Santi saw these seven callosities upon a camel just born; and he is unwilling to believe that they are an hereditary effect of the labour to which the species has been subjected for many centuries. This is an opinion which these naturalists have adopted, and it has been echoed by historians: Gibbon says the camel bears marks of servitude. For the same reason, that he is born with it, M. Santi doubts the opinion which has also been expressed, that the hump on the back of the camel is an hereditary effect of constant pressure upon that part. We are only acquainted with the domesticated camel; for although M. Desmoulins, a distinguished French naturalist, asserts that the camel existed in a wild state in Arabia in the time of

Adrian (A.D. 117), and the natives of Central Africa maintain that they are to be found wild in the mountains where Europeans have never penetrated, it is highly probable that these statements refer to individual camels wandering from the control of man. We know nothing distinctly of the camel but as one of the most useful and important servants of the human race; and, therefore, we have no means of contrasting a wild with a domesticated species. But, in the absence of positive evidence to the contrary, it is more easy to believe that the original organization of the camel should have been adapted to the services to which it is destined, than that the services should have altered the organization. The callosities enable the animal to receive its load (in the only position in which man could put on that load), by preventing the fracture of its skin by the pressure either when it rises up or kneels down; and the hump on the back is so far from being a callosity produced by friction, that it is a soft, fatty substance, which is gradually absorbed into the system when the animal is without food, and is renewed when he obtains pasturage; an evident proof that it is one of the several admirable provisions which he possesses for his support in the desert. We could as readily believe that the wonderful mechanism of the camel's stomach, by which it is enabled to abstain from water for many days, is a result of its habits, instead of its powers of abstinence being a consequence of this construction, as that its hump and its callosities are merely hereditary badges of its subjection to man; and yet this opinion, monstrous as it is, has been adopted by a distinguished

naturalist, as we shall have occasion more particularly to notice.

The uses which the camel has served in the civilization of mankind, in those countries of the East where civilization first commenced, have been of such importance that they would fairly enter into the scheme of a wise and beneficent Providence. Unless such an animal had existed in Asia (a country intersected by immense arid plains, and impassable with burdens except by a creature possessing at once great strength and an extraordinary capacity of enduring privation), the intercourse of mankind would have been confined to small spots where abundance reigned; the commodities of one part of that immense region could not have been exchanged for those of another; commerce, the great moving principle in the extension of civilization, would have been unknown; and knowledge would have been limited to particular districts, and would there have been of the most stunted and feeble growth, in the same way that a native crab-stock produces sour and worthless fruit, till some slip from the tree of another climate is grafted upon it. Thus, instead of the learning of the Hindoos and the Egyptians being communicated from one region to the other,* and thence, spreading over Greece, becoming the imperishable possession of the human race; and instead of the produce of the East being brought to the West, to induce that taste for comforts and luxuries which principally develops the human intellect, that portion of mankind which was first civilized would probably at this day have been in the same state of ignorance

* See Frederic Schlegel's History of Literature.

as the Indians of South America, whose communications are cut off by sandy deserts and inaccessible mountains, and who thus believe that the affairs of their mission (a settlement of a few hundred natives under a priest) comprise everything that can be of interest to any individual of the great family of man.

Asia is, without doubt, the original country of the camel. The earliest mention of commerce in the Sacred Writings is associated with the caravans. When the brethren of Joseph had cast him into a pit, "they sat down to eat bread; and they lifted up their eyes and looked, and behold a company of Ishmaelites came from Gilead, with their camels bearing spicery, and balm, and myrrh, going to carry it down to Egypt."* It would appear, from this mention of spices, and from the more particular notice of cinnamon in the third chapter of Exodus, that the products of India were exported into Egypt and Palestine; for cinnamon is an exclusive production of India, although the ancients erroneously supposed this spice, as well as all the other spicies of commerce, to have grown in Arabia. The Arabians were the great carriers, in the early times, of the valuable produce of the Indian peninsula. Isaiah speaks of the commerce of Sabæa or Sheba (Arabia Felix): "The merchants of Sheba and Ramah, they were thy merchants; they occupied in thy fairs with chief of all spices, and with all precious gold and stones." This commerce was probably, for many centuries, entirely carried on by land, and chiefly by the agency of the camel; but we learn from the Journal of Nearchus, a navigator of the time of Alexander the

* Genesis, c. xxxvii., v. 25.

Great, whose work has come down to us, and has been admirably translated and commented upon by Dr. Vincent, that the Arabians, three hundred years before Christ, traded to India by sea. In the time of Pliny, this active people had considerable factories on the coasts of Malabar and Ceylon. The Arabians carried their merchandise across the deserts to Egypt; and while they thus possessed a monopoly of the Indian trade as regarded Egypt, the Egyptians held the same monopoly as regarded Europe.

The camel of Asia is frequently mentioned, not only by sacred but profane writers, as connected with the warlike operations of the Eastern people as well as with their commerce. It was a custom of the nations of Judea, when they went to battle, to adorn their camels with studs and collars of gold: "And Gideon arose, and slew Zebah and Zalmunna, and took away the ornaments that were on their camels' necks."* The same practice of adorning camels is said to prevail at the present day in many of the countries of Asia. In Egypt the camel was known from the earliest antiquity; for in the twelfth chapter of Genesis we find it stated that Pharaoh bestowed camels upon Abram when he came with his wife into that country.

In the countries of the East, among the many remarkable contrasts which the natural productions and the customs of the people present to those of Europe, there is nothing more striking than the universal employment of the camel. It is not necessary to penetrate into the interior of Asia to witness this great change in the mode by which

* Judges, c. viii., v. 21.

commercial operations are conducted. For instance, the merchant who visits the seaport of Smyrna, the great point of traffic between the Franks and the Turks, sees this new animal power everywhere around him, performing those services which he has been accustomed to observe executed by the horse and the mule; and even superseding, and rendering unnecessary, that great medium of more advanced communication, canal carriage. Burckhardt, the celebrated traveller, says, "In countries where camels are bred in great numbers, land-carriage is almost as cheap as that by water. The carriage for a camel-load of goods, weighing from six to seven hundred pounds English, from Bagdad to Aleppo, a distance of six hundred miles, is four pounds."* All labour, of course, is cheaper in countries where the people are contented with scanty fare, and know nothing of those luxuries which almost the meanest among us enjoy; but the great abundance of camels, and the easy rate at which they are maintained, render this animal power the readiest instrument of commercial intercourse. The use of it is therefore universal throughout Asia Minor, a country where considerable trading adventures are carried on, and from which Europeans, and particularly the English, derive large supplies of the valuable productions of a fertile soil and a delicious climate.

The Turks, who are idle and luxurious, and affect a contempt for the quiet virtues, call the Armenians, whom they despise as a patient and drudging race, camels. This is a compliment both to the poor animals and the Armenians, for the cam-

* Twenty dollars. Travels in Nubia, 4to, p. 120.

els are the most amiable of creatures. Their good-nature to other beasts, we are told, is remarkable. They will let the goats of the towns and villages share their meals, and almost take the provender from their mouths; the ass of the driver takes equal liberties, and dogs lie down to sleep with them without interruption. But the Turks take a sorry advantage of those periodical fits of rage which constitute the exception to the general character of this useful creature. At particular seasons of the year, camel-fights are common at Smyrna and at Aleppo. Such exhibitions are the disgrace of the vulgar (be they the high or the low vulgar) of all countries; and the lion-fights of the savage Romans, the bullfights of Spain, the bull and badger baitings and cockfights of England, and the camel-fights of Asia Minor, are equally indications of a barbarian spirit, which can only be eradicated by knowledge and true religion. Of these, however, the camel-fights appear the least objectionable. The camels of Smyrna are led out to a large plain, filled with eager crowds. They are muzzled to prevent their being seriously injured, for their bite is tremendous, always bringing the piece out. A couple being let loose, they run at each other with extreme fury. Mr. Macfarlane thus describes to us this curious scene: "One of the favourite holy-day amusements of the Turks of Asia Minor is furnished by the camel combats. An enclosure is made, and two camels, previously muzzled so that they cannot hurt each other much, are driven in, and incited to fight with each other. Their mode of combat is curious: they knock their heads together (laterally), twist their long necks, wrestle

with their fore legs, almost like bipeds, and seem to direct their principal attention to the throwing down of the adversary. During this combat, the Turks, deeply interested, will back, some one camel and some the other; and they will clap their hands and cry out the names of their respective favourites, just as our amateurs do with their dogs, or as the Spaniards, at their more splendid and more bloody bullfights, will echo the name of the hardy bull or the gallant *matador*. The pacha of Smyrna used frequently to regale the people with these spectacles in an enclosed square before his palace; and I saw them besides, once, at a Turkish wedding at the village of Bournabah, near Smyrna, and another time, on some other festive occasion, at

Camels Fighting.

Magnesia. I once, however, chanced to see a less innocent contest, which I have noticed in my volume of travels. This was on the plain between Mount Sipylus and Tartalee and the town of Smyrna. It was a fight in downright earnest. Two huge rivals broke away from the string, and set to in spite of their drivers. They bit each other furiously, and it was with great difficulty the devidgis succeeded in separating these (at other times) affectionate and docile animals." The popular amusements which the camel affords in other parts of the East are of a less ferocious nature. At a particular season of the year, the Mohammedans in the neighbourhood of Mount Sinai have *camel races*, and this festival is a time of great rejoicing.*

The training of the camels to bear burdens, in the countries of the East, has not been *minutely* described by any traveller. M. Brue, who, at the latter part of the seventeenth century, had the management of the affairs of a French commercial company at Senegal, says, "Soon after a camel is born, the Moors tie his feet under his belly, and, having thrown a large cloth over his back, put heavy stones at each corner of the cloth, which rests on the ground. They in this manner accustom him to receive the heaviest load." Both ancient and modern authors agree tolerably well in their accounts of the load which a camel can carry. Sandys, in his "Travels in the Holy Land," says, "Six hundred weight is his ordinary load, yet will he carry a thousand." The camel sometimes carries large panniers filled with heavy goods; sometimes bales are strapped on his back, fastened either

* Burckhardt's Syria, p. 490.

with cordage made of the palm-tree or leathern thongs; and sometimes two or more will bear a sort of litter, in which women and children ride with considerable ease. The animal is so docile and steady, so regular in his movements and precise in his steps, and, withal, so capable of sustaining a very large and unwieldy burden, that his driver seldom hesitates about the bulk, or the awkwardness in any other way, of what he places on his back. Captain Lyon, among the Arabs of Northern Africa, observed many of the children carried in leather bags, which were ordinarily used to keep corn in; and in one instance he saw a nest of children on one side of a camel, and its young one in a bag hanging on the other. In the Great Desert, Riley, who was a captive to the Arabs, used to assist the women and children to place themselves in baskets, which were made of camel's skin, and fixed in such a manner, with a wooden rim around them, over which a skin was sewed, that three or four could sit in them with perfect safety and ease, only taking care to preserve their balance. But the patience of the camel in bearing every sort of load, and his uncomplaining nature when overburdened, sometimes lead to oppression. He is occasionally too heavily weighted; and though there prevails an opinion that he will not rise with too great a load, he often sinks under his burden and expires.

Bishop Heber, in his journey to Cawnpoor, in the East Indies, says, "In the course of this evening my attention was attracted by the dreadful groans of one of our baggage-camels, at some little distance among the trees. I went to the spot, and

found that two of the 'sarbauns,' or camel-drivers, had bound its legs in a kneeling posture, so that it could not rise or stir, and were now busy in burning it with hot irons in all the fleshy, muscular, and cartilaginous parts of its body. They had burned six deep notches immediately under the eye, its haunches, and head, and were now applying the torturing instrument to its forehead and nostrils. I asked what they were doing, and they answered that it had a fever and wind, and would die if they did not treat it in this manner." The animal did die in a few hours. This was not intended as cruelty, for the Indians, doubtless, firmly believed in the efficacy of their torture. Among many rude nations, particularly those of Africa, the excitement produced by burning muscular and fleshy parts of the body is the general remedy for every disease of the human frame; and as the people sometimes get well in spite of the remedy, the credit of the art is never impeached by the sufferings of its victims. Quackery is everywhere the same, endeavouring to make particular remedies of universal application; and, therefore, necessarily committing an infinity of mistakes of the most serious consequence.

Avarice and ill temper will occasionally make the Arabs and Turks maltreat their camels; though it is due to them to state that these instances are rare. The animal is usually treated with the care and kindness which his usefulness and his goodness demand. Mr. Macfarlane says, "I have been told that the Arabs will kiss their camels in gratitude and affection after a journey across the deserts. I never saw the Turks, either of Asia Minor

or Roumelia, carry their kindness so far as this; but I have frequently seen them pat their camels when the day's work was done, and talk to them on their journey, as if to cheer them. The camels appeared to me quite as sensible to favour and gentle treatment as a good-bred horse is. I have seen them curve and twist their long lithe necks as their driver approached, and often put down their tranquil heads towards his shoulder."

Again he says, "Near Smyrna, and at Magnesia and Sardes, I have occasionally seen a camel (a special favourite) follow his master like a pet dog, and go down on his knees before him as if inviting him to mount. I never saw a Turk ill use the useful, gentle, amiable quadruped. But I have frequently seen him give it a portion of his own dinner, when, in unfavourable places, it had nothing but chopped straw to eat. I have sometimes seen the devidjis, on a hot day or in passing a dry district, spirt a little water in the camels' nostrils; they pretend it refreshes them."

The Asiatics and Africans distinguish as dromedaries those camels which are used for riding. There is no essential difference in the species, but only in the breed. The camel of the heavy caravan, the baggage camel, may be compared to the dray-horse; the dromedary to the hunter, and, in some instances, to the race-horse. It is to be regretted that naturalists have called the camel with one hump the dromedary, for this appellation produces a confusion in reading those travels which, very properly, use the name dromedary as applied by the natives to a swift or riding camel. Burckhardt, before his expedition into Nubia, bought two

dromedaries, one of which he rode ten hours a day for thirty-five days. The speed of some of these animals is very great, compared with the slow march of the caravan. Messengers on dromedaries, according to Burckhardt, have gone from Darou to Berber in eight days, while he was twenty-two days with the caravan on the same journey.

The first experiment which a European makes in bestriding a dromedary is generally a service of some little danger, from the peculiarity of the animal's movement in rising. Denon has described this with his usual vivacity. During the French invasion of Egypt, a part of Dessaix's division, to which the scientific traveller was attached, was sent with camels to a distant post across the desert. "The *boute-selle* (the mounting at a signal) was very amusing. The camel, slow as he generally is in his actions, lifts up his hind legs very briskly at the instant his rider is in the saddle; the man is thus thrown forward: a similar movement of the fore legs throws him backward. Each motion is repeated; and it is not till the fourth movement, when the camel is fairly on his feet, that the rider can recover his balance. None of us could resist the first impulse; and thus nobody could laugh at his companions."* Mr. Macfarlane tells us in his letter, that upon his first camel adventure he was so unprepared for the probable effect of the creature's rising behind, that he was thrown over his head, to the infinite amusement of the Turks, who were laughing at his inexperience. His description of this experiment is as lively as that of Denon: "I was acquainted with this pecu-

* Denon, Voyage, tom. ii., p. 221, Paris, 1802.

liarity of animal movement in a striking manner, the first time I mounted a camel out of curiosity. I ought to have known better, and, indeed, did know better; but, when he was about to rise, from old habits associated with the horse, I expected he would throw out his fore legs, and I threw myself forward accordingly, when up sprung his hind legs, and clean I went over his ears, to the great amusement of the devidjis."

Riley tells a somewhat similar story of the effect of the rough movement of a large camel: "They placed me on the largest camel I had yet seen, which was nine or ten feet in height. The camels were now all kneeling or lying down, and mine among the rest. I thought I had taken a good hold, to steady myself while he was rising; yet his motion was so heavy, and my strength so far exhausted, that I could not possibly hold on, and tumbled off over his tail, turning entirely over. I came down upon my feet, which prevented my receiving any material injury, though the shock to my frame was very severe. The owner of the camel helped me up, and asked me if I was injured: I told him no. 'God be praised!' said he, 'for turning you over; had you fallen upon your head, these stones must have dashed out your brains. But the camel,' added he, 'is a sacred animal, and Heaven protects those who ride on him! Had you fallen from an ass, though he is only two cubits and a half high, it would have killed you; for the ass is not so noble a creature as the camel and the horse.' I afterward found this to be the prevailing opinion among all classes of the Moors and the Arabs. When they put me on again, two of the

men steadied me by the legs until the camel was fairly up, and then told me to be careful, and to hold on fast; they also took great care to assist my companions in the same way."*

Every preparation for a long journey being completed—the dromedaries and horses having their riders on their backs, and the camels having received their bales of goods and their water-skins—the caravan sets forward on its march. In Asia, an ass, bearing a tinkling bell, usually walks at the head, and the camels follow, one by one. Mr. Macfarlane thus describes this arrangement, as well as their measured pace: "The caravans, or strings of camels, are always headed by a little ass, on which the driver sometimes rides. The ass has a tinkling bell round his neck; and each camel is *commonly* furnished with a large, rude bell, that produces, however, a soft and pastoral sound, suspended, not to the neck, but to the front of the pack or saddle. As I have observed of the mules of Spain and Italy, they will all come to a dead stop if these bells be removed by accident or design; and like the mules also, they always go best in a long single line, one after the other. We tried the experiment of the bell at Pergamos. Two stately camels, the foremost furnished with the bell, were trudging along the road with *measured* steps: we detached the bell with a long stick; they halted as the sounds ceased, nor could we urge them forward until their ears were cheered with the wonted music. I have used the word *measured*, not as matter of poetry, but of fact. Their step is so *measured* and like clockwork, that on a plain you know almost to a

* Riley's Shipwreck and Captivity, p. 289, 4to.

yard the distance they will go in a given time. In the flat valleys of the Hermus and Caicus, I have made calculations with a watch in my hand, and have found, hour after hour, an unvarying result, the end of their journey being just at the same pace as the beginning: their pace is three miles an hour." He adds, "I may remark as curious, that the devidjis always preserve the same order of distribution, or, as we might say, in military language, 'dress the line,' in the same manner. Thus one camel always goes first, another second, another third, and so on; and if this order is interfered with, the beasts will become disorderly, and will not march. Each gets attached to a particular camel of the caravan, prefers seeing his tail before him to that of any other, and will not go if you displace his friend." "We met caravans of camels," says Dr. Clarke, speaking of Cyprus, "marching according to the order always observed in the East; that is to say, in a line, one after the other; the whole caravan being preceded by an ass, with a bell about his neck."* Burckhardt gives the reason for the camels thus travelling in a single file: "The Souakin caravans, like those of the Hedjaz, are accustomed to travel in one long file: the Egyptians, on the contrary, march with a wide extended front; but the former method is preferable, because, if any of the loads get out of order, they can be adjusted by leading the camel out of the line before those behind have come up; in the latter case, the whole caravan must stop when any accident happens to a single camel. The caravans from Bagdad to Aleppo and Damascus, consisting

* Travels, vol. iv., p. 74, 8vo.

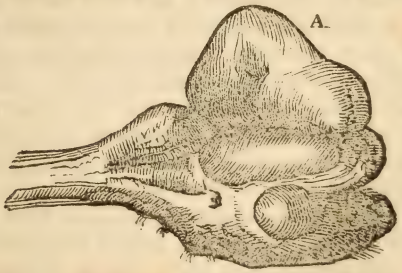
sometimes of two thousand camels, marching abreast of each other, extend over a space of more than a mile." The individual camels, which march in line, invariably follow the steps of the one which precedes them; and thus they are often led wrong if the drivers are negligent. They are sometimes tied, the one to the tail of the other, like strings of horses in England. Burckhardt, in his journey from Mecca to Medina,* says, "the Arab riding foremost was to lead the troop; but he frequently fell asleep, as well as his companions behind, and his camel then took his own course, and often led the whole caravan astray." In the deserts, it requires especial vigilance and extraordinary local knowledge in the drivers to keep the right direction. The compass is sometimes used; but generally, the camel-drivers ascertain their course by some marks known only to themselves; some sand-bank, or prickly shrubs, which only their experienced eye can distinguish from similar objects. "Every spot in the plains of Arabia is known by a particular name; and it requires the eyes and experience of a Bedouin to distinguish one small district from another. For this purpose, the different species of shrubs and pasturage produced in them by the rains are of great assistance; and whenever they wish to mention a certain spot to their companions, which happens to have no name, they always designate it by the herbs that grow there."† The camels of the caravan are wholly dependant upon those which precede them for the regularity of their pace or for their haltings; and they therefore are completely under the direction of the lead-

* Travels in Arabia, 1829. † Burckhardt's Arabia.

er, whether the man or the beast assume that office. Even a rider can never stop his dromedary while its companions are moving on ; and thus it is a point of excellence in a traveller, with which the Arabs are highly pleased, to jump off and remount without stopping his beast.* The leading camel, however, requires to be excited by its rider ; and, if it is not urged on by hearing the human voice, it gradually slackens its pace, and at last stands still to rest. If the leading camel once stops, all the rest do the same. Burckhardt, in his journey through Arabia, often walked ahead of the caravan: he sometimes had to wait a long time for its coming up, and having retraced his steps, would find the camels standing still, and every soul upon them fast asleep. It is indifferent to these poor creatures where they stop ; for they are regardless of shade, and will remain quietly exposed to the hottest beams of the sun.† As long as the voice of the driver is heard, the camel does not heed what situation he is in. Captain Lyon saw a blind camel-driver, who held by the animal's tail, and was in the habit, with this assistance, of going constantly over an uneven and dangerously steep track. Whatever be the nature of the road they toil over, they plod steadily on. Burckhardt says, "it is an erroneous opinion that the camel delights in sandy ground; it is true that he crosses with less difficulty than any other animal; but, wherever the sands are deep, the weight of himself and his load makes his feet sink into the sand at every step, and he groans and often sinks under his burden. It is the hard, gravelly ground of the desert which is most agreeable

* Burckhardt's Syria. † Clarke, iv., 74.

to this animal." Major Denham says, that in the stony desert "the sharp points bruise their feet, and they totter and fall under their heavy loads." This is an apparent and not a real contradiction between these two excellent authorities. The foot of the camel is adapted to tread upon a smooth surface, whether that surface be hard or soft. This foot is divided into two toes, without being separated. It is partly like the hoof of a horse, and partly cloven; for a horny sole spreads from the heel forward, under the foot, uniting the middle part, and leaving the toes free. This horny sole is part of an elastic substance, which, being bedded in two cavities of the foot, yields to the pressure of the soil; while the toes spread upon touching the ground, in the same way that the reindeer's foot extends, to present a large surface to the snow.* We thus see



Inside of a Camel's Foot.—A *is the cushion upon which the animal treads, shown as lifted out of its beds.*

that the camel, having a very large, spreading, and elastic foot, moves with ease over any smooth surface, and does not sink into the sands with his heavy

* See Preliminary Discourse.

lading and his own large body, in the same way that he would if his foot were small and hoofed, as that of the horse. From the opinion of our obliging correspondent, Mr. Macfarlane, we should be led to conclude that loose stones are not such an annoyance to the camel as might at first be supposed. He says, "The foot, certainly formed by nature to tread a loose sandy soil, does not, however, appear to me to suffer from stony or hard roads. In Asia Minor there are mountains in every direction; the paths across them are hard, rough, and loose, as rocks and broken stones can make them; yet I have often seen camels treading them without any appearance of suffering; and though I have met them in my travels, hundreds in a day, I do not remember having ever seen a wounded hoof." The surface which the camel chiefly dislikes is mud; for in that he slips about: and thus he is, with the greatest difficulty, prevailed upon to cross a loose, muddy track, however narrow, though he will wade through a river without much entreaty. Mr. Macfarlane assures us, that he has seen the devidjis spread the coverings of their tents, and even their own garments, over the obnoxious ground, that the camels might walk without fear.

The camel will ascend and descend hills if they are not too steep. In the desert they sometimes meet with sand-banks, from twenty to sixty feet high, and almost perpendicular, which must be crossed. The camel, in such situations, constantly blunders and falls with his heavy load; and, in descending, the Arabs hang with all their weight on the animal's tail, to steady him.* Thus his docil-

* Denham, p. 28.

ity compensates, in some degree, for the difficulty which he occasionally finds in travelling; and it must be remembered, that sharp rocks and steep hills are the exceptions to the general character of the countries over which he travels, and for which his conformation is so admirably adapted. Rivers also rarely occur, and yet the camel will readily cross them. Norden, a celebrated Danish traveller in Egypt and Nubia, was struck with the mode in which loaded camels crossed the Nile. "A man swam before, holding in his mouth the bridle of the first camel; the second camel was fastened to the tail of the first, and the third to the tail of the second. Another man, sitting on a truss of straw, brought up the rear, and took care that the second and third camels should follow in a row." Captain Lyon heard from natives of Africa, that camels are conducted across the Niger by men who hold them by their long upper lips, and keep their heads above water: the forepart of that animal being the heaviest, another man sits behind the hump, in order to raise the fore and depress the hinder parts while crossing. Major Denham describes a passage of the Shary, an African river, which was effected with considerable risk: "The stream was extremely rapid, and our horses and camels were carried away from the sides of the canoe to which they were lashed: we lost a camel by this passage; these animals have a great dislike to water, and, after swimming a stream, are often seized with illness, and are carried off in a few hours." Burckhardt, describing the passage of a river in Nubia, says, "An inflated goatskin was tied to the neck of each camel, to aid it in swim-

ming; but we had great difficulty in getting them into the water, the Egyptian camel not being accustomed to this mode of passing the river. My guide stripped, and laid hold of the tail of his camel with one hand, while he urged the beast forward with a stick which he carried in the other." Thus we see that, under different circumstances, and in various countries, different methods are employed to convey the camel across streams upon which there are no rafts or boats; and that though the patient animal has an objection to the water, his docility triumphs over his instinct, and he yields to the will of his driver, sometimes even at the peril of his life.

The halts of the caravan for the night are exceedingly curious and picturesque. We shall avail ourselves of Mr. Macfarlane's communications, before we proceed to those of other observers:

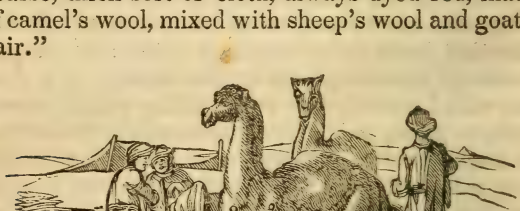
"On their journeys, the devidjis always choose for halting-places spots that abound in bushes or brakes, where such are to be found; the camels are left at liberty to browse, and their drivers smoke their pipes or go to sleep. There is no danger of the camels escaping or wandering to any distance; they keep close to the spot where they are set at liberty, and can be rallied and formed in a line in a moment. I have more than once seen this done by the mere voice. When they rest for the night, they generally kneel down in a circle; it is rarely considered necessary to tie one of their fore legs at the bend of the knee. They always repose on their knees; and a curious thing in relation to their natural habits is, that I never

saw one of them throw himself, *even for a moment*, on his side. During the night's rest, the devidjis generally sleep in the midst of the circle formed by the recumbent camels; if it be a *rainy* winter night, they will pitch a little tent, but (I speak of Asia Minor) in this genial climate they nearly always repose like their quiet beasts, *à la belle étoile*. I once invaded a primitive dormitory of this sort in a curious manner. It was at Boudja, a village (a few miles from Smyrna) where many of the Franks have their country houses. I was hurrying home on a very dark night; at the entrance of the village and in the shadow of a garden wall, I stumbled over something which proved to be a young camel (they accompany their dams on their journeys almost as soon as they are born); and, going forward, I stumbled again over a sack, and fell headlong through an opening of the 'domestic circle' into the midst of it, and upon the sleeping *devidjis*. I suppose they were surprised at the intrusion, but both men and beasts were very civil; the latter, indeed, never moved, and seemed as passive as if I had been falling over roots of trees."

Camels are formed by nature to endure great variations of temperature. The winds of the desert are sometimes exceedingly keen; and, even in Asia Minor, the winter cold is occasionally very severe. We add one more quotation from Mr. Macfarlane's interesting letter:

"The winter of 1827–8 was the coldest that had been known for many years in Asia Minor; yet, on the coldest days, when I, though a native of the north, have been shivering and suffering, I have

often seen the camels, at nightfall, *bivouacking* near Smyrna, on the banks of the Meles (Homer's river—as insignificant as is, or *was*, Fleet-ditch in summer, but a broad, brawling stream in winter), there to pass the inclement night in the open air. Their own instinct teaches them to contract their circle and kneel close together, and their masters merely cover their loins with a material as primitive as their modes of life and encamping. It is a coarse, thick sort of cloth, always dyed red, made of camel's wool, mixed with sheep's wool and goat's hair."



Halt of Camels—DENON.

The chief repose of a caravan is in the evening. Camels on their march never feed at their ease in the daytime; and nature seems to require that they should have their principal meal, and a few hours' rest, from a little before sunset to several hours before sunrise. The principal halts in Syria and Arabia are, therefore, for two hours at noon, when every one endeavours to sleep, and from an hour or so before the sun goes down till the morning twilight.* When the caravan is about to pro-

* Burckhardt's Syria.

ceed over a steril district, the drivers, several days before they start, give the camels three times the usual quantity of dhourra (millet), which they force down their throats, and the construction of the stomach enables the animal to ruminate upon this during a very long march.* The expense of maintaining these valuable creatures is remarkably little: a cake of barley, a few dates, a handful of beans, will suffice, in addition to the hard and prickly shrubs which they find in every district but the very wildest of the desert. They are particularly fond of those vegetable productions which other animals would never touch, such as plants which are like spears and daggers in comparison with the needles of the thistle, and which often pierce the incautious traveller's boot. He might wish such thorns eradicated from the earth, if he did not observe the camel contentedly browsing upon them; for he thus learns that Providence has made nothing in vain. The sant-tree is among these substances, and in this the camel especially delights. These hard shrubs probably contain large quantities of saline matter. In the Great Desert, Riley saw the camels crop off the thorn-bushes as thick as a man's finger. Their teeth are particularly adapted for such a diet. Differing from all other ruminating tribes, they have two strong cutting teeth in the upper jaw; and of the six grinding teeth, one on each side, in the same jaw, has a crooked form: their canine teeth, of which they have two in each jaw, are very strong; and in the lower jaw the two external cutting teeth have a pointed form, and the foremost of the grind-

* Burckhardt's Nubia.

ers is also pointed and crooked. They are thus provided with a most formidable apparatus for cutting and tearing the hardest vegetable substance. But the camel is, at the same time, organized so as to graze upon the finest herbage, and browse upon the most delicate leaves; for, his upper lip being divided, he is enabled to nip off the tender shoots, and turn them into his mouth with the greatest facility. Whether the sustenance, therefore, which he finds be of the coarsest or the softest kind, he is equally prepared to be satisfied with, and to enjoy it. In the desert, from Aleppo to Bagdad, Mr. Parsons occasionally passed through little flowery vales, covered with the choicest clover, where the camels grazed; and in crossing some inconsiderable hills, which, though stony, were not bare of grass, besides producing rosemary, thyme, camphor, marjoram, origanum, and southernwood, the camels seemed delighted to snatch a mouthful from these fragrant shrubs by way of variety, though the horses would not touch them. The young and fresh leaves of the acacia-trees are peculiarly grateful to them; and the Bedouins, spreading a straw mat under the tree, beat its boughs with long sticks, and sell these tender leaves for camel's food.* The Nubians were one year without any produce from their date-trees, because the Mamelukes, in a time of great scarcity, fed their camels upon palm-leaves. The camel is particularly fond of a plant, the silphium of antiquity, which was valued as a sovereign remedy for all complaints of the human body, from the time of Herodotus to that of Pliny. This plant produces

* Burckhardt's Arabia.

very fatal effects upon all quadrupeds; but tne camels greedily devour it, as did the sheep of old, according to the description of Arrian. The camel is therefore muzzled when he travels through the countries in which silphium abounds, the Cyrenaica; and, lest the drivers should allow him to taste it, and he should thus be destroyed, an additional sum is charged for the hire of the animal through those districts, as a compensation for this chance of injury.* The camel will, indeed, eat every vegetable substance; and it is affirmed that, in cases of need, he will even distend his stomach with coals. The African caravans carry coals through the desert; and Riley states, that in the absence of all other food, the camels received a supply of this singular food once a day. They are partly enabled to endure these extraordinary privations by the absorption into their system of the fat of the hump.†

The long establishment of commercial intercourse in Asia by means of caravans, and the necessity of accommodating large bodies of Mohammedan pilgrims from all parts of the east to Mecca, have caused the erection, from time to time, of large reservoirs of water in almost every frequented road. In the vicinities of the towns, these reservoirs, which are called birkets, are usually supplied from aqueducts. At these convenient places the caravans always halt. The Bedouins and other wandering tribes sometimes seize upon these wells, and extort a tribute for the permission

* See Beechey's Northern Coast of Africa, p. 410.

† See Dictionnaire Classique d'Histoire Naturelle; art. *Chameau*, by M. A. Desmoulins.

Camels Watering—DENON.

to draw water. As soon, however, as a caravan arrives upon the desert, the supply of water becomes a matter of chance. The accustomed fountains are often dried up; and the travellers have to journey forward, in the hopes of discovering some other well at which they may refresh their camels and replenish their water-skins.

In a journey with a caravan, it is essentially necessary to carry a considerable quantity of water. Sometimes a portion of the camels bear nothing but water-skins; but oftener every camel carries one skin in addition to his ordinary lading. "No idea can be formed by Europeans," says Burckhardt, "of the quantity of water necessary for drinking, cooking, and washing, during a journey through these countries; but more particularly to allay the thirst of the traveller, whose palate is continually parched by the effects of the fiery ground and air; who has been confined, perhaps, for several days to a short allowance of water, and

who lives upon food which, consisting of farinaceous preparations and butter, is calculated to excite thirst in the highest degree. It is a general custom in the caravans in these parts (Nubia), as well as in the Arabian deserts, never to drink except when the whole caravan halts for a few minutes for that purpose. . . . . To drink while others do not exposes a man to be considered effeminate, and to the opprobrious saying, that 'his mouth is tied to that of the water-skin.' . . . Travellers in these journeys drink a great quantity of water when it is plentiful; I do not exaggerate when I say that I have often drunk in the afternoon, at one draught, as much as would fill two common water-bottles. . . . The usual computation is, that a middle-sized skin or gerbe, holding about fifty or sixty pounds of water, will serve a man for three days."* Captain Lyon says, that when horses travel with a caravan in Africa, it is necessary to provide a camel for each horse, for the sole purpose of carrying water. It would appear from these passages (and such is the fact), that of the water which the camels carry, no part is allowed to themselves. The men and horses have the advantage of their patient drudgery; and they are left, in almost every case, to the precarious supply which they may find at the fountains which are so thinly scattered over the deserts. Upon the subject of the camel's power of abstinence from water, there have been many exaggerations, which Burckhardt ascribes to the credulity of those travellers "who draw their information only from bragging Arabians or Moors.'

* Burckhardt's Nubia, p. 428.

This power, however, is extraordinary enough to excite our wonder and admiration, without any assistance from fanciful descriptions. The camel often travels three or four days without water, drinking fifty, sixty, or even a hundred pounds weight when he has an opportunity; and the best camels for transport will sometimes endure a thirst of ten or twelve days, though many of them perish under this privation. When we see what the man and the horse require in those arid countries, such a power in the camel must appear one of the most remarkable provisions of nature.

The camel's stomach, when considered with reference to its anatomical construction—a knowledge of which is necessary to understand the capacity of the animal to endure hunger and thirst, particularly the latter, and which, without such knowledge, would appear little short of miraculous —exhibits a mechanism so admirable, so curious, so perfect in all its parts, and, withal, so delicate, that we cannot hesitate at once to consider it as beautiful an evidence of Almighty wisdom as any of the mechanical contrivances of the human body, such as the hand or the eye, with which we are more familiar.

CHAPTER IX.

THE CAMEL—(*Continued*).

THE habits of mankind in the East have undergone less change during many centuries than Europeans would at first sight think possible. Many of the descriptions of the sacred historians find an exact parallel in the narratives of modern travellers. The agriculture and the commercial intercourse of the Oriental nations are as little changed as their food, their dress, and their manners; and their intellectual progress during the last two thousand years, if it has not been at a stand, has been so slow as to be hardly perceptible. This perpetuation of the habits of a remote antiquity may be very much attributed to the geographical features, the climate, soil, and natural productions of the countries. For instance, in a soil and temperature peculiarly adapted to the ripening of fruit, the date would still flourish as it flourished in the time of the prophets; and while the people could gather with little trouble this great article of sustenance, they would have little motive to cultivate grain, which much of their soil is unfitted to produce. Thus the improvements of agriculture, demanding and rewarding improvements in various other of the useful arts, have had no place among them.

Their vast deserts, producing but few of the ne-

cessaries, and none of the luxuries of life, rendered, in the earliest ages, an extensive commerce the necessary condition of pleasurable existence. And commerce was made easy by the camel, the native of these arid plains; through whose means they have been traversed with comparative facility from the earliest times. But navigation by the "ship of the desert" did not require, and was not capable of, that gradual improvement which has transformed the frail raft or rude canoe into a floating palace,

"Arm'd with thunder, clad with wings,"

the crown and triumph of ages, of thought and labour, and the greatest conquest which the mind of man has achieved over the difficulties in which, for the development of his wonderful powers, it has pleased God to place him.

Thus, while the improvements of European commerce, itself the creature of yesterday, have at length succeeded in bringing the cotton of India to be manufactured in England into cloth, and have returned it to the Hindoos cheaper than these people could prepare it for themselves, with all their abundant supply of human labour at its lowest price, the caravans of Egypt and Arabia are still carrying on the traffic of the age of Solomon, with scarcely any change either in the articles of the commerce or the manner in which it is pursued. The caravans of Egypt bring to Cairo ostrich feathers, gum, gold-dust, and ivory, from Abyssinia and the countries beyond it; while those of Arabia exchange there the spices, coffee, perfumes, and muslin of Hindostan. By means of caravans, the pro-

ductions even of China are distributed, at the present day, through central Asia; while, by the extension of the camel over Northern Africa, the articles which are sold in the markets of Timbuctoo are exchanged for the equally valuable commodities of Samarcand and Thibet. There are caravans trading between Cairo and the interior of Africa, and penetrating far beyond the limits of modern European discovery, which are wholly employed in the commerce of slaves, the most disgraceful traffic by which one portion of the human race has ever inflicted injury upon another. Burckhardt describes the treatment which the slaves of the African caravans experience as "rather kind than otherwise." He says, "they are seldom flogged, and are well fed." This is before they enter upon the desert; for, as confinement injures their health, when they remain in the towns through which they pass, and as the negroes look upon the houses as prisons, the traders allow them, in these inhabited places, a little liberty. But after the caravan reaches the open country, they are treated in a manner at which humanity shudders. "On the journey they are tied to a long pole, one end of which is fastened to a camel's saddle, and the other, which is forked, is passed on each side of the slave's neck, and tied behind with a strong cord, so as to prevent him from drawing out his head; in addition to this, his right hand is also fastened to the pole at a short distance from the head, thus leaving only his legs and left arm at liberty; in this manner he marches the whole day behind the camel; at night he is taken from the pole and put in irons."*

* Burckhardt's Nubia, p. 335.

And yet this horrible mode of transport is not so bad as the abominations of a slave-*ship*, in which hundreds of miserable wretches are crammed into a hold, till they die of utter exhaustion or disease, and avarice is deprived of its victims. The slave-traders of the caravans are Mohammedans; the European slave-merchants call themselves Christians. The infidel carries his victim to receive the comparatively light yoke of domestic service; the Christian dooms his prey to the unutterable horrors of West Indian bondage.

The annual pilgrimage to Mecca, enjoined by the Mohammedan religion, has materially contributed to keep up and extend the commercial intercourse of the people of Asia. In this point of view, the ceremony, though one of superstitious origin, and accompanied with many absurd rites, has greatly benefited those countries which are far distant from each other, and the inhabitants of which, without such excitement, would seldom have any communication. The pilgrimage to Mecca is an institution which unites all the Mohammedans, from Abyssinia to India, in a common bond of religious observance and commercial traffic; and it has thus had an extraordinary influence upon the habits of that large body of mankind who are followers of the doctrines of the Koran. In the present day, the hadj or pilgrimage has gradually decreased in numbers; a circumstance which is attributed both to a growing indifference of the Mohammedans to their religion, and an increase of expense attending the journey. The camel sustains such an important part in these extraordinary journeys, that we shall attempt to trace the course of a single

caravan of pilgrims; and as that of Cairo is one of the most important, having, as well as the Syrian, the distinction of a sacred camel, and as it has been described by ancient as well as modern writers, a rapid sketch of its march may be given. We may thus develop, in a picturesque way, some of the remarkable circumstances attending the progress of a vast number of camels, laden with the merchandise of unexplored regions: some bearing "Barbaric pearl and gold," others carrying water-skins; and all exposed to perish in the desert, at the command of avarice or of enthusiasm, patiently doing the bidding of those who make this perilous journey, "some to Mammon, some to Mohammed," as old Purchas expresses it. In the words of the same quaint writer, "let us desire the reader to have patience, and goe along, on this pilgrimage, with one of these caravans, thorow these Arabian deserts, to Mecca and Medina."

The hadj caravan starts from Cairo twenty days after the great fast of the Ramadhan is ended. Purchas has given an elaborate description of its ancient splendours. "The caravan," he says, "is divided into three parts; the foreward, the maine bataille, and the rereward. The foreward containeth about a third part of the people. Within a quarter of a mile followeth the maine bataille, with their ordnance, gunners, and archers; the chief physician, with his ointments and medicines for the sick, and camels for them to ride on. Next goeth the fairest camel that may be found in the Turk's dominions, decked with cloth of gold and silk, and carrieth a little chest, in form of the Israelitish ark, containing in it the Alcoran, all written with great

letters of gold, bound between two tables of massive gold. This chest is covered with silke during the voyage; but, at their entering into Mecca and Medina, it is covered with cloth of gold adorned with jewels. This camel is compassed about with Arabian singers and musicians, singing alway, and playing upon instruments. After this follow fifteene other most faire camels, every one carrying one of the above said vestures, being covered from top to toe with silke. Behind these goe the twentie camels which carry the captaine's money and provision. After followeth the standard of the Great Signior, accompanied with musicians and souldiers; and behind these, lesse than a mile, followeth the rereward, the greatest part pilgrimes: the marchants, for securitie, going before; for in this voyage it is needfull and usuall, that the captaines bestow presents, garments, and turbans upon the chiefe Arabians, to give them free passage, receiving sometimes, by pilferings, some damage notwithstanding."

Mr. Parsons, who saw the pilgrim caravan set out from Cairo about forty years ago, has given a programme of the procession, drawn up with all the precision of a herald, and which occupies ten pages of his quarto work. The cavalcade was six hours in passing him. The most striking appearance to a European must have been the camels, in every variety of splendid trappings, laden with provisions, and clothes, and cookery apparatus, and water-skins, and tents, and artillery, and holy sheiks, and Mamelukes. There were camels "with two brass field-pieces each;" others "with bells and streamers;" others "with men beating

kettle-drums;" others "covered with purple velvet;" others "with men walking by their sides, playing on flutes and flagelets;" others "handsomely ornamented about their necks, their bridles being studded with silver, intermixed with glass beads of all colours, and ostrich feathers on their foreheads;" and, last of all, "the sacred camel, an extraordinary large camel, with a fine bridle studded with jewels and gold, and led by two holy sheiks in green, a square house or chapel on his back." In addition to these camel-splendours, there were horses with every variety of caparison; Mamelukes, and pikemen, and janizaries, and agas, and the emir hadgy (commander of the pilgrimage), in robes of satin; to say nothing of numberless "buffoons playing many pranks."

Differing from the usual practice of commercial caravans, the pilgrimage is performed chiefly by night. The caravan generally moves about four o'clock in the afternoon, and travels without stopping till an hour or two after sunrise. A large supply of torches is carried from Cairo, to be lighted during the hours of darkness. The Bedouins, who convey provisions for the troops, travel by day only, and in advance of the caravan. The watering-places on the route are regularly established. Each is supplied with a large tank, and protected by soldiers, who reside in a castle by the well throughout the year. On parts of the route the wells are frequent and the water good; but on others three days of the journey frequently intervene between one watering-place and another, and the fountain is often brackish. When the Cairo caravan is completely assembled, and the formalities which we

have just described are gone through, the great body of travellers begin to move, the stations of the different parties of hadjys, according to their provinces and towns, being appointed and rigidly observed throughout the march. This order is determined by the geographical proximity of the place from which each party comes. At Adjeroud, where the Egyptian caravan halts on the second day's march, it is supplied with water from Suez; and here it reposes a day and a night, to prepare for a forced march of three days and two nights, through a region where there is no water, the desert of El Tyh, which nearly extends from the head of one gulf of the Red Sea to the other; that is, from Suez to Akaba. The hadj route is circuitous. It is here that the privations both of men and quadrupeds commence. The splendid trappings of the camels, their velvets and their bells, have lost their attraction; but their power of endurance becomes the safety of the pilgrims: while the richly caparisoned horse, impatient of thirst and more easily subdued by fatigue, is more frequently a burden to the caravan than an advantage. The route of the Egyptian caravan, after it passes the Akaba, lies by the shores of the Red Sea for nearly six hundred miles; and, therefore, it cannot properly be said at any time after the first ten days' march to be upon the desert, as the Syrian caravan is for thirty days. But its difficulties are more numerous; and it has to pass regions quite as arid and inhospitable. Every part of Arabia is covered with sandy plains; and, when the mountain steeps are crossed, the long extended valleys rarely offer water. The Arabic language is rich in words ex-

pressing every variety of desert, differing from each other by very slight shades of meaning: thus they have terms descriptive of a plain, a plain in the mountain, a plain covered with herbs, a naked sandy desert, a stony desert, a desert with little spots of pasturage, a desert without water.* Although the caravan route from Cairo to Mecca presents, with the exception of the desert El Tyh, none of those enormous wastes, like the great southern desert of Arabia, "where the Arabs have only the sun and the stars to direct their way;" nor is, like the Libyan desert, "a sea without waters, an earth without solidity, disdaining to hold a footprint as a testimony of subjection,"† there are many tracts, as well as the desert from Suez to Akaba, in the forty days' journey, which offer to the pilgrim abundance of fatigue and suffering. If water fail, as it sometimes does, even at the wells at particularly dry seasons; if the water-skins evaporate more quickly then they ordinarily do, the camel's power of endurance is severely tried, for his wants are the last attended to. Happy are the pilgrims if the rain of the mountains have filled the banks of some little river. Even the much-enduring camels, at the sight of water after many days' abstinence, break the halters by which they are led, and, in rushing or stumbling down the banks, throw off their loads, and occasion infinite disorder.‡ Mr. Buckingham has, however, described a scene, in which the patience of the camel is contrasted in a remarkable way with the eagerness of the horse:

* See Humboldt's Voyage, tom. vi. note to p. 67.
† Purchas. ‡ Burchardt's Nubia, p. 368.

"It was near midnight when we reached a marshy ground, in which a clear stream was flowing along, through beds of tall and thick rushes, but so hidden by these that the noise of its flow was heard long before the stream itself could be seen. From the length of the march and the exhausting heat of the atmosphere, even at night, the horses were exceedingly thirsty; their impatient restlessness, evinced by their tramping, neighing, and eager impatience to rush all to one particular point, gave us, indeed, the first indications of our approach to water, which was perceptible to their stronger scent long before it was even heard by us. On reaching the brink of this stream, for which purpose we had been forcibly turned aside, by the ungovernable fury of the animals, to the southward of our route, the banks were found to be so high above the surface of the water that the horses could not reach it to drink. Some, more impatient than the rest, plunged themselves and their riders at once into the current; and, after being led swimming to a less elevated part of the bank, over which they could mount, were extricated with considerable difficulty; while two of the horses of the caravan, who were more heavily laden than the others, by carrying the baggage as well as the persons of their riders, were drowned. The stream was narrow but deep, and had a soft muddy bottom, in which another of the horses became so fastly stuck that he was suffocated in a few minutes. The camels marched patiently along the edge of the bank, as well as those persons of the caravan who were provided with skins and other vessels containing small supplies of water; but the horses could not, by all the power of their riders,

be kept from the stream any more than the crowd of thirsty pilgrims, who, many of them having no small vessels to dip up the water from the brook, followed the example of the impatient horses, and plunged at once into the current. . . . . This scene, which, amid the obscurity of the night, the cries of the animals, the indistinct, and, perhaps, exaggerated apprehensions of danger, from a totally unexpected cause, had assumed an almost awful character, lasted for upward of an hour."*

The extraordinary scent of the camel enables him to discover water at a great distance; and thus, in the wildest regions of the desert, the caravan is often preserved from destruction by this instinct. In the neighbourhood of wells, such as are found in the hadj routes, the camels, after passing rocky districts, that fatigue them more than several days' march upon the plains, surfeit themselves with water. This renders them still weaker, and they often perish. Camels' carcasses are as frequently found in the accustomed roads as in the deserts; and, when the pilgrimage leaves Mecca, the very air is corrupt with the bodies of camels that have died of exhaustion after performing the journey.† On the road, when a camel falls, he is usually killed according to the Mohammedan fashion, which is to turn his head towards Mecca and cut his throat. On such occasions the Arabs wait in savage impatience the signal of the owner, ready to plunge their knives into the poor animal and tear off a portion of the flesh. At seasons of great privation, the water which is found in the cells of the camel's stomach is eagerly swallowed by the Arabs.

* Buckingham's Mesopotamia, vol. ii., p. 8.
† Burckhardt's Arabia.

The fourth, fifth, and sixth days' marches of the Cairo hadj, through the deserts of Tyh, are exceedingly exhausting and dangerous. The weary pilgrims halt for a day and a night at the castle of Nakhel, in the middle of the desert, where they replenish their water-skins; but they march again in the evening of the seventh day, and, finding no water in their route, halt not till the morning of the tenth, when they have reached the plain and castle of Akaba. This district presents fearful monuments of the sufferings of the caravan. "Past the Akaba," says Burckhardt, "near the head of the Red Sea, the bones of dead camels are the only guides of the pilgrim through the wastes of sand." It is, perhaps, rarely that the pilgrims perish with thirst on the road, unless some of them wander from the main body; or the caravan, losing its way, overshoots the day's station. Where there are no landmarks but those which are formed by the traces of former devastation—by "the bones of dead camels"—such a circumstance is not difficult to happen even to the most experienced guides. The water-skins are, in such cases, emptied, and horses and men perish in a state of miserable despair, while the wearied camels drop with exhaustion. Probably these afflictions happen more frequently to private caravans than to those of the pilgrimage. Burckhardt relates an interesting story of such an event in the Nubian desert, which beautifully illustrates the surprising instinct of the camel. It was told to him by a man who had himself suffered all the pangs of death:

"In the month of August, a small caravan prepared to set out from Berber to Daraou. They

consisted of five merchants and about thirty slaves, with a proportionate number of camels. Afraid of the robber Naym, who at that time was in the habit of waylaying travellers about the well of Nedjeym, and who had constant intelligence of the departure of every caravan from Berber, they determined to take a more eastern road, by the well Owareyk. They had hired an Ababde guide, who conducted them in safety to that place, but who lost his way from thence northward, the route being very unfrequented. After five days' march in the mountains their stock of water was exhausted, nor did they know where they were. They resolved, therefore, to direct their course towards the setting sun, hoping thus to reach the Nile. After two days' thirst, fifteen slaves and one of the merchants died; another of them, an Ababde, who had ten camels with him, thinking that the camels might know better than their masters where water was to be found, desired his comrades to tie him fast upon the saddle of his strongest camel, that he might not fall down from weakness; and thus he parted from them, permitting his camels to take their own way: but neither the man nor his camel were ever heard of afterward. On the eighth day after leaving Owareyk, the survivers came in sight of the mountains of Shigre, which they immediately recognised; but their strength was quite exhausted, and neither men nor beasts were able to move any farther. Lying down under a rock, they sent two of their servants, with the two strongest remaining camels, in search of water. Before these two men could reach the mountain, one of them dropped off his camel, deprived of speech, and able only to move

his hands to his comrade as a signal that he desired to be left to his fate. The surviver then continued his route; but such was the effect of thirst upon him that his eyes grew dim and he lost the road, though he had often travelled over it before, and had been perfectly acquainted with it. Having wandered about for a long time, he alighted under the shade of a tree, and tied the camel to one of its branches; the beast, however, smelt the water (as the Arabs express it), and, wearied as it was, broke its halter, and set off galloping furiously in the direction of the spring, which, as it afterward appeared, was at half an hour's distance. The man, well understanding the camel's action, endeavoured to follow its footsteps, but could only move a few yards; he fell exhausted on the ground, and was about to breathe his last, when Providence led that way, from a neighbouring encampment, a Bisharye Bedouin, who, by throwing water on the man's face, restored him to his senses. They then went hastily together to the water, filled the skins, and, returning to the caravan, had the good fortune to find the sufferers still alive. The Bisharye received a slave for his trouble. My informer, a native of Yembo, in Arabia, was the man whose camel discovered the spring; and he added the remarkable circumstance, that the youngest slave bore the thirst better than the rest, and that, while the grown-up boys all died, the children reached Egypt in safety."

The phenomenon of the *mirage* excites in the pilgrim of the deserts those alternations of hope and disappointment which add to the miseries of his actual situation. He sees before him lakes of

water, which are gone the instant he arrives at the spot where he fancied they offered their refreshment to his feverish lips. The Arabs are familiar with this remarkable appearance, and they are seldom deceived by it; although, if the mirage and a real stream could be seen at the same time, it would be difficult to distinguish the reality from the delusion.* The guides of the European traveller often amuse themselves by calling to him that water is in sight, when they are upon the most thirsty spots of a sandy or gravelly plain. Burckhardt has described the mirage with his usual felicity :† "During the whole day's march we were surrounded on all sides by lakes of mirage, called by the Arabs, Serab. Its colour was of the purest azure, and so clear that the shadows of the mountains which bordered the horizon were reflected in it with the greatest precision, and the delusion of its being a sheet of water was thus rendered still more perfect. I had often seen the mirage in Syria and Egypt, but always found it of a whitish colour, rather resembling a morning mist, seldom lying steady on the plain, but in continual vibration; but here it was very different, and had the most perfect resemblance to water. The great dryness of the air and earth in this desert may be the cause of the difference. The appearance of water approached also much nearer than in Syria and Egypt, being often not more than two hundred paces from us, whereas I had never seen it before at a distance of less than half a mile. There were at one time about a dozen of these false lakes around us, each separated from the other, and, for the most part, in

* Lyon, p. 347. † Nubia, p. 193.

the low grounds." The mirage is caused by the extraordinary refraction which the rays of the sun undergo in passing through masses of air in contact with a surface greatly heated. These atmospheric delusions are not confined to the appearance of water in the desert. The traveller, fainting beneath a burning sun, sees a tree in the distance sufficiently large for him to find a shade beneath its boughs. He quickens his pace, hoping to enjoy half an hour of refreshing coolness before his camels shall have passed. The tree is really a miserable shrub, that does not afford shade enough to shelter one of his hands. This magnifying of objects is produced by the slight vapour which rises when the heat is greatest. When the sun gleams on the sandhills, they appear at an immense distance ; the traveller hopes that his camels may be spared the pain of crossing these slippery ascents ; when, in a few minutes, he is close upon them, and sees a man or a camel within a stone's throw toiling to the top.* As the sun ascends towards the zenith, and the earth and the currents of air assume different temperatures, the phenomena of the mirage present numerous modifications. Humboldt states, that in the plains of South America, where the air is very dry, he often saw the images of troops of wild oxen suspended in the air long before the eye could see the oxen themselves ; and the small currents of air were of such a variable temperature, that the legs of some appeared to rest upon the ground, while others were elevated above it. In Arabia, Niebuhr observed the image of an animal reversed before he saw the direct image.

* See Lyon, p. 347.

Sometimes towers and large masses of apparent buildings are seen upon the horizon, which disappear at intervals, without the traveller being able to decide upon the true forms of the objects, which are probably little sandhills, beyond the ordinary range of vision.* All these phenomena are modifications of the mirage, though the name is generally applied to the unreal lakes of the desert. The Persian and Arabian poets make frequent allusion to these magical effects of terrestrial refraction.

Such delusive appearances must have a tendency to fill the mind of the inexperienced traveller with a vague and somewhat awful wonder. Upon a sandy surface, too, the stillness of the desert is particularly impressive. Passing over such a soil, the camel's tread produces scarcely any sound. Capt. Lyon says, "I have sometimes walked at night from the kafflé (caravan), and have experienced a sensation I am unable to describe, as I felt the wind blow past me, and heard the sound which my figure caused me to make by arresting its progress." It is at such moments that the European traveller may think of the solemn denunciation of the prophet against Babylon; and may fancy for a while that he is the only tenant of the sandy wastes: "The sea is come up upon Babylon, she is covered with the multitude of the waves thereof: her cities are a desolation, a dry land, and a wilderness, a land wherein no man dwelleth, neither doth any son of man pass thereby."† Of the tediousness of a journey through these arid regions there can be no doubt; and Mr. Buckingham seems to have felt

* Humboldt's Voyages, liv. vi., chap. xvii.
† Jeremiah.

the full force of its monotony: "In walking my horse a gentle pace, if I mounted the last in the caravan, I could gain the head of it in two hours, though our line extended nearly two miles in length; when, as was the practice of most of the other horsemen of the party, we dismounted on the grass, suffered our horses to feed there, and either lay down or smoked a pipe for nearly an hour, until the caravan had all passed us again. This was repeated at every similar interval; so that, in an uninteresting part of the country, where there was no picturesque landscape to charm the sight, not a tree to relieve the monotonous outline of the hills, nor sufficient verdure to clothe their rocky sides; where either we were lighted only by the stars, or scorched by the sun an hour after its rising, its tediousness may easily be conceived." And yet even the desert has its pleasures: when the caravan reaches some wished-for fountain, and finds a patch of verdure or a few shrubs after many hours of privation. Major Denham has prettily described a scene of this nature: "The day had been oppressively hot; my companions were sick and fatigued, and we dreaded the want of water. A fine dust, arising from a light clayey and sandy soil, had also increased our sufferings: the exclamations of the Arab who first discovered the wells were indeed music to our ears; and, after satisfying my own thirst, with that of my weary animals, I laid me down by one of the distant wells, far from my companions; and these moments of tranquillity, the freshness of the air, with the melody of the hundred songsters that were perched among the creeping plants, whose flowers threw an aromatic odour

all around, were a relief scarcely to be described." The happiness of such a contrast must naturally be great; and so many writers have described this pleasure, that the idea has passed from the poetical into the popular language even of the West; and thus the recollection of an interval of joy amid a life of suffering,

"The greenest spot
In memory's waste,"

is the Oasis in the desert.

And yet to an imaginative mind, stored with knowledge and ardent in the pursuit of new objects of research, even the dreariest wilds of the desert have their charm. Burckhardt, according to Captain Beechey, "has frequently been heard to declare that his most pleasant hours in travelling had been passed in the desert;" and Captain Beechey, himself an adventurous traveller, has well explained this. "If the desert have terrors peculiar to itself, it also has its peculiar pleasures. There is something imposing, we may say sublime, in the idea of unbounded space which it occasionally presents; and every trifling object which appears above its untenanted surface, assumes an interest which we should not, on other occasions, attribute to objects of much greater importance. The little romance which its stillness and solitude encourage, is, at the same time, grateful to the feelings; and one may here dream delightfully of undisturbed tranquillity and independence, and of freedom from all the cares, the follies, and the vices of the world." A principal source of this calm of the mind, when surrounded by real hardships and cheerless solitudes, must spring from that feeling which is one of

the most elevating of all the various trains of human thought, the consciousness of an earnest determination to struggle with difficulties. Whether the privations of the uncivilized or the crosses of the social life are to be overcome, to meet the evil, whatever it be,

> "Nor bate a jot
> Of heart or hope, but still bear up and steer
> Right onward ;"

this is in itself a triumph ; and the world can give nothing better than those moments when a man feels that he has looked dangers and annoyances in the face, and that he shall surmount them.

The hot wind of the deserts has been described as producing the most fatal effects, as suffocating men and beasts in an instant. This is one of the exaggerations which attach to such remarkable phenomena, they being generally described by persons who have only heard of their results. Burckhardt, who seldom relates anything but of his own knowledge, was very anxious to prove the truth of these relations ; and, according to the accounts which he had from the Arabs, as well as from his own experience, the evil, though a serious one, is not so tremendous as travellers in general have pretended.

"I again inquired, as I had often done before, whether my companions had often experienced the semoum (which we translate by the 'poisonous blast of the desert,' but which is nothing more than a violent southeast wind). They answered in the affirmative, but none had ever known an instance of its having proved fatal. Its worst effect is, that it dries up the water in the skins, and so far it en-

dangers the traveller's safety. In these southern countries, however, water-skins are made of very thick cow-leather, which are almost impenetrable to the semoum. In Arabia and Egypt, on the contrary, the skins of sheep or goats are used for this purpose ; and I witnessed the effect of a semoum upon them, in going from Tor to Suez over land, in June, 1815, when in one morning a third of the contents of a full water-skin was evaporated. I have repeatedly been exposed to the hot wind in the Syrian and Arabian deserts, in Upper Egypt and Nubia. The hottest and most violent I ever experienced was at Suakin ; yet even there I felt no particular inconvenience from it, although exposed to all its fury in the open plain. For my own part, I am perfectly convinced that all the stories which travellers or the inhabitants of the towns of Egypt and Syria relate of the semoum of the desert, are greatly exaggerated, and I never could hear of a single well-authenticated instance of its having proved mortal either to man or beast. The fact is, that the Bedouins, when questioned on the subject, often frighten the townspeople with tales of men, and even of whole caravans, having perished by the effects of the wind ; when, upon closer inquiry, made by some person whom they find not ignorant of the desert, they will state the plain truth. I never observed that the semoum blows close to the ground, as commonly supposed, but always observed the whole atmosphere appear as if in a state of combustion : the dust and sand are carried high into the air, which assumes a reddish, or bluish, or yellowish tint, according to the nature and colour of the ground from which the dust

arises. The yellow, however, always more or less predominates. In looking through a glass of a light yellow colour, one may form a pretty correct idea of the appearance of the air, as I observed it during a stormy semoum at Esne, in Upper Egypt, in May, 1813. The semoum is not always accompanied by whirlwinds; in its less violent degree it will blow for hours with little force, although with oppressive heat; when the whirlwind raises the dust, it then increases several degrees in heat. In the semoum at Esne, the thermometer mounted to 121° in the shade; but the air seldom remains longer than a quarter of an hour in that state, or longer than the whirlwind lasts. The most disagreeable effect of the semoum on man is, that it stops perspiration, dries up the palate, and produces great restlessness. I never saw any person lie down flat upon his face to escape its pernicious blast, as Bruce describes himself to have done in crossing this desert; but, during the whirlwinds, the Arabs often hide their faces with their cloaks, and kneel down near their camels, to prevent the sand or dust from hurting their eyes. Camels are always much distressed, not by the heat, but by the dust blowing into their large, prominent eyes: they turn round and endeavour to screen themselves by holding down their heads; but this I never saw them do except in case of a whirlwind, however intense the heat of the atmosphere might be. In June, 1813, going from Esne to Siout, a violent semoum overtook me upon the plain between Farshyout and Berdys; I was quite alone, mounted upon a light-footed hedjin. When the whirlwind arose, neither house nor tree was in sight; and while I was en-

deavouring to cover my face with my handkerchief, the beast was made unruly by the quantity of dust blown into its eyes and the terrible noise of the wind, and set off at a furious gallop; I lost the reins, and received a heavy fall; and, not being able to see ten yards before me, I remained wrapped up in my cloak on the spot where I fell, until the wind abated; when, pursuing my dromedary, I found it at a great distance, quietly standing near a low shrub, the branches of which afforded some shelter to its eyes.

"Bruce has mentioned the moving pillars of sand in this desert; but, although none such occurred during my passage, I do not presume to question his veracity on this head. The Arabs told me that there are often whirlwinds of sand, and I have repeatedly passed through districts of moving sands, which the slightest wind can raise; I remember to have seen columns of sand moving about like water-spouts in the desert, on the banks of the Euphrates, and have seen at Jaka terrible effects from a sudden wind; I therefore very easily credit their occasional appearance on the Nubian desert, although I doubt of their endangering the safety of travellers."

In a subsequent part of his travels in Nubia, the same accurate observer, to whom we are under so many obligations in this account of the camel, has described the most tremendous hurricane of the desert which he ever witnessed: "A dark blue cloud first appeared, extending to about 25° above the horizon; as it approached nearer and increased in height, it assumed an ash-gray colour, with a tinge of yellow, striking every person in the cara-

van who had not been accustomed to such phenomena, with amazement at its magnificent and terrific appearance. As the cloud approached still nearer, the yellow tinge became more general, while the horizon presented the brightest azure. At last it burst upon us in its rapid course, and involved us in darkness and confusion; nothing could be distinguished at the distance of five or six feet; our eyes were filled with dust; our temporary sheds were blown down at the very first gust, and many of the more firmly fixed tents followed; the largest withstood for a time the force of the blast, but were at last obliged to yield, and the whole camp was levelled with the ground. In the mean time, the terrified camels arose, broke the cords by which they were fastened, and endeavoured to escape from the destruction which appeared to threaten them." Some writers state, that camels, at the very first blast of the semoum, bury their noses in the sand.

Such are the dangers to which a caravan, travelling through the deserts of Asia and Africa,* is exposed; and, however splendidly appointed may be the caravans of the hadj, they cannot escape these dangers, or materially diminish the privations of all those who pass over such dreary regions. It must be quite evident that, without the camel, the journey would be totally impossible. With this useful creature, whose value to the pilgrim is beyond all price, its difficulties are alleviated and its dangers averted; and if men can in any degree

* Humboldt has calculated, from maps constructed upon a large scale, that the great desert of Africa, without including Bornou and Darfour, extends over 194,000 square leagues. The immensity of this waste will be apparent when it is considered that the Mediterranean Sea only occupies 79,800 square leagues.

emulate the camel's endurance and abstinence, as the Arabs do by constant habit, there may be hunger, and thirst, and fatigue, but exhaustion and death will be battled with, and the weak, the faint of heart, and the luxurious only will fall in the struggle.

The Egyptian pilgrims remain a day and night at the castle of Akaba; their course then lies by the eastern shore of the Red Sea. The road by which they proceed is at first rocky and barren; but upon the third day after the caravan leaves Akaba, the travellers find wells of sweet water and date-trees in abundance; and this agreeable contrast to the desert through which they have passed continues for several days. The roads are, indeed, infested by robbers; and at every halting-place there are plunderers ready to rush upon the straggler, and often to destroy him. About the twentieth day of the journey the caravan again passes through a barren valley without water; and the wells are so distant, that the march is continued for two days and a night without a halt. The town of Beder is at length reached on the twenty-ninth day, where the travellers find rest and refreshment. The route is little varied, either by difficulties or pleasures, for several days onward, when the road crosses a steep sandhill, which Burckhardt saw covered with carcasses of camels, the relics of the late hadj caravans. The neighbouring plains are spotted with tamarisk-trees, which delight in sand, and in the driest season, when all vegetation around them is withered, never lose their verdure. Beyond Kholeys, about three days' journey from Mecca, is a narrow ascending path between rocks,

affording room for the passage only of one camel. The torrents which run down this defile in winter entirely destroy the road; and the poor camels stumble with their loads over large sharp blocks of stone, which wound their feet. On the day before the pilgrims reach Mecca, they repose in a valley covered with Saracen buildings, Arab huts, and date-groves; and remarkable for its numerous henna-trees, with the odoriferous flowers of which, reduced to powder, the people of the East dye the palms of the hands, the soles of the feet, or the nails of both; the pilgrims always carry henna home as a present to their female relations. Near Mecca are two great reservoirs of water, one for the Egyptian, the other for the Syrian caravan; they are about six hundred years old, and were constructed by the munificence of the Turkish sultans. That appropriated to the Egyptian pilgrims is about one hundred and sixty feet square, and from thirty to thirty-five feet in depth; it is supplied by an aqueduct. After thirty-seven days journey from the gardens of Cairo, the hadj enters Mecca with great solemnity. It would be beside the purpose of this work to describe the ceremonies in the birthplace of Mohammed, which may more properly find a place in an account of the manners of the East. The city presents an extraordinary spectacle of business and pleasure, of devotion and licentiousness. The rich hadjys spend their wealth luxuriously; the mendicants display their rags and proclaim their miseries in the courts of the great mosque; and very few exhibit any real devotion, such as was contemplated in the original institution of the pilgrimage. One remarkable scene, however, may be

given from Burckhardt (who was present during this great solemnity of the East), the sermon at the mountain of Arafat, some distance from Mecca; here the camel occupies a prominent station:

"The time of Aszer (or about three o'clock P.M.) approached, when that ceremony of the hadj takes place for which the whole assembly had come hither. The pilgrims now pressed forward towards the mountain of Arafat, and covered its sides from top to bottom. At the precise time of Aszer the preacher took his stand upon the platform on the mountain, and began to address the multitude. This sermon, which lasts till sunset, constitutes the holy ceremony of the hadj, called Khotbetel Wakfe; and no pilgrim, although he may have visited all the holy places of Mecca, is entitled to the name of hadj, unless he has been present on this occasion. As Aszer approached, therefore, all the tents were struck; everything was packed up; the caravans began to load, and the pilgrims belonging to them mounted their camels, and crowded round the mountain to be within sight of the preacher, which is sufficient, as the greater part of the multitude is necessarily too distant to hear him. The two pachas, with their whole cavalry drawn up in two squadrons behind them, took their post in the rear of the deep lines of camels of the hadjys, to which those of the people of the hedjaz were also joined; and here they waited, in solemn and respectful silence, the conclusion of the sermon. Farther removed from the preacher was the Sherif Yahya, with his small body of soldiers, distinguished by several green standards carried before him. The two Mahmals, or holy camels, which carry on their

back the high structure that serves as the banner of their respective caravans, made way with difficulty through the ranks of camels that encircled the southern and eastern sides of the hill, opposite to the preacher, and took their station, surrounded by their guards, directly under the platform in front of him. The preacher, or khatyb, who is usually the kadhy of Mecca, was mounted on a finely caparisoned camel, which had been led up the steps; it being traditionally said, that Mohammed was always seated when he here addressed his followers, a practice in which he was imitated by all the califs who came to the hadj, and who from hence addressed their subjects in person. The Turkish gentleman of Constantinople, however, unused to camel-riding, could not keep his seat so well as the hardy Bedouin prophet; and the camel becoming unruly, he was soon obliged to alight from it. He read his sermon from a book in Arabic which he held in his hands. At intervals of every four or five minutes he paused, and stretched forth his hands to implore blessings from above; while the assembled multitudes around and before him waved the skirts of their ihrams (cloaks) over their heads, and rent the air with shouts of 'Lebeyk, Allahuma Lebeyk' (i. e., 'Here we are at thy commands, oh God!'). During the wavings of the ihrams, the side of the mountain, thickly-crowded as it was by the people in their white garments, had the appearance of a cataract of water; while the green umbrellas, with which several thousand hadjys, sitting on their camels below, were provided, bore some resemblance to a verdant plain."

We have thus gone through the history of the camel. The subject is full of interest; and we could not, therefore, hastily dismiss an animal which forms such an important part in the economy of the human race. The horse and the elephant are perhaps the only other creatures that afford equally valuable services to man, in labouring for his benefit, and are equally connected with his history. They each are intimately associated with the progress of society in every region of the world; and they each offer the most remarkable adaptation of powers to the peculiar duties which they have to perform. Their labour may continue to be, as it has been, superseded by the inventions of machinery, and by those modes of communication which are independent of their power either wholly or in part; but the advance of civilization and the triumphs of art could never have been thus far accomplished without the previous domestication of these three valuable servants; and it is doubtful whether, at any more advanced stage of human art, their services can be greatly dispensed with.

The scientific character of the species is as follows:

Teeth—Incisors, $\frac{2}{6}$. Canine, $\frac{1-1}{1-1}$. Molar, $\frac{6-6}{5-5}$.
Total, 34.

Two pointed teeth implanted in the incisive bone.
The scaphöid and cuböid of the tarsus (bones of the instep) separate.
The two toes united underneath, nearly to the extremities, by a common sole.
The upper lip cleft and swelled.
No horns.

The camels are inhabitants of the Old World, and are almost exclusively found in Asia and Africa. The female goes with young eleven or twelve months, and produces only one at a birth.

CHAPTER X.

THE LLAMA.

THE llamas form a secondary group of camels, offering to the eye of the naturalist very small anatomical differences of construction from that of the camel, properly so called. The foot of the llama is not, like that of the camel, covered with an elastic sole which joins the two toes. From the absence of this entire sole, the species of South America is enabled to climb the precipices of the Andes, which are its native region, the toes having strong nails, each of which has a thick cushion or pad below. The llama also wants the second canine tooth in the lower jaw; but this difference is not by some considered such as to require a separation of the genus: for deer of various species have the same deviation from the general type. Again, the absence of the hump in the llama species is not an anatomical difference which constitutes a character; for as the skeleton of the Bactrian camel with two humps does not differ from that of the Arabian with one, so does the arrangement of the bones of the llama agree precisely with the conformation of the camel.

In the gardens of the Zoological Society are two

individuals of the llama family, which are described in the guide to the gardens as varieties of the same species. The one which principally attracts attention, by the lightness of its make, the brilliancy of its eye, and the beautiful tawny-brown colour of

The Llama. *Auchenia Glama*, ILLIGER and F. CUVIER.—*Lama*, BUFFON and CUVIER.

its coat, stands about four feet from the sole of the foot to the withers. He was presented to the society by Robert Barclay, Esq. This llama often exhibits the remarkable peculiarity of its species, that of spitting when it is offended; and as it easily takes offence, even at a look, the visiters of the gardens have abundant opportunities of disproving what has so often been asserted, that its saliva has something venomous in its quality. We have re-

ceived a plentiful shower of it in the face, without feeling any of those blisters which travellers used to describe with great minuteness. This animal, too, is somewhat inclined to strike with his fore feet; and he often raises himself upon the iron railing of his enclosure with an appearance of a great desire to do mischief. The power of his teeth is considerable; for, upon some sudden fit of rage, in the autumn of last year, he tore a large piece out of a strong door at one effort.

The llamas of South America furnish a beautiful example of the determination of the locality of a particular group of animals, according to the elevation of the surface where they find their food. This selection is probably determined by temperature. The llamas are stationed upon different stages of the Cordilleras; and are found or disappear throughout that enormous chain of mountains, as the summits are elevated or depressed. Thus they range considerably below the line of perpetual snow, from Chili to new Granada, without reaching the Isthmus of Panàma. The species is not found in Mexico; and this remarkable circumstance is to be ascribed to the fact that, at the isthmus, the Cordillera has a less elevation than is suited to their natures and wants. In the same way some of the Alpine animals of Europe (such as the bouquetin), which never descend into the plains, are found upon mountains at long intervals, although the line of their summits is interrupted. This locality is determined by elevation. The same fact is constantly observed with regard to plants.

The llama was found by the Spaniards at the period of their conquest of South America. It was

the only beast of burden which the natives possessed. Its flesh was eaten by the Indians, and its wool was woven into cloth. Augustin de Zarate, who in 1544 held the office of treasurer-general in Peru, and who wrote an account of the conquest, thus describes the llama (which he calls a sheep), as it was observed in the mountains of Chili:

"In the places where there is no snow the natives want water; and to supply this want they fill the skins of sheep with water, and make other living sheep carry them: for it must be remarked that these sheep of Peru are large enough to serve as beasts of burden. They resemble the camel in their shape, although they have not the hump on the back, like that animal. They can carry about a hundred pounds or more; and the Spaniards used to ride them, and they would go four or five leagues a day. When they are weary, they lie down on the ground; and as there are no means of making them get up, either by beating or assisting them, the load must, of necessity, be taken off. When there is a man on one of them, if the beast is tired and is urged to go on, he turns his head round and discharges his saliva, which has a very bad odour, into the rider's face. These animals are of great use and profit to their masters; for their wool is very good and fine, particularly of that species named *pacas*, which have very long fleeces: and they are of little expense for nourishment, for a handful of maize suffices them, and they can go four or five days without water. Their flesh is as good as that of the fat sheep of Castile. There are now public shambles for the sale of their flesh

in all parts of Peru where the animal is found. This was not the case when the Spaniards first came; for when one Indian had killed a sheep, his neighbours came and took what they wanted, and then another Indian killed a sheep in his turn."* This last custom is probably that of all uncivilized people, among whom commerce is unknown; but it is a singular illustration of the simplicity of these poor natives, who were content to take their supply of food, whether of fruits or of flesh, without much trouble either of cultivation or traffic. In a century or two the arts of civilized life were, to a small extent, forced upon them. Captain George Shelvocke, an Englishman, who sailed round the world in 1719–22, thus describes the llamas which he saw at Arica, in Peru:

"For the carriage of the guana the people at Arica generally use that sort of little camels which the Indians of Peru call *llamas;* the Chilese, *chilihneque:* and the Spaniards, *carneros de la tierra*, or native sheep. The heads of these animals are small in proportion to their bodies, and are somewhat in shape between the head of a horse and that of a sheep, the upper lips being cleft, like that of a hare, through which they can spit to the distance of ten paces against any one who offends them; and if the spittle happens to fall on the face of a person, it causes a red itchy spot. Their necks are long and concavely bent downward, like that of a camel, which animal they greatly resemble, except in having no hunch on their backs, and in being much smaller. Their ordinary height is from four feet to four and a half, and their ordinary burden

* Histoire du Perou, vol. i., p. 177. Paris, 1716.

does not exceed a hundred weight. They walk, holding up their heads, with wonderful gravity, and at so regular a pace as no beating can quicken. At night it is impossible to make them move with their loads, for they lie down till these are taken off, and then go to graze. Their ordinary food is a sort of grass called yeho, somewhat like a small rush, but finer, and has a sharp point, with which all the mountains are covered exclusively. They eat little, and never drink, so that they are easily maintained. They have cloven feet, like sheep, and are used at the mines to carry ore to the mills; and, as soon as loaded, they set off without any guide to the place where they are usually unloaded.

"They have a sort of spur above the foot, which renders them sure-footed among the rocks, as it serves as a sort of hook to hold by.* Their hair, or wool rather, is long, white, gray, and russet, in spots, and fine, but much inferior to that of the vicunna (vigonia), and has a strong and disagreeable scent.

"The vicunna is shaped much like the llama, but much smaller and lighter, their wool being extraordinarily fine and much valued. These animals are often hunted after the following manner: many Indians gather together, and drive them into some narrow pass, across which they have previously extended cords about four feet from the ground, having bits of wool or cloth hanging to them at small distances. This so frightens them that they dare not pass, and they gather together in a string, when the Indians kill them with stones tied to the

* This is fabulous.

ends of leather thongs. Should any guanacos happen to be among the flock, these leap over the cords, and are followed by all the vicunnas. These *guanacos* are larger and more corpulent, and are also called viscachas.

"There is yet another animal of this kind called *alpagnes* (alpacas), having wool of extraordinary fineness; but their legs are shorter, and their snouts contracted in such a manner as to give them some resemblance to the human countenance.

"The Indians make several uses of these creatures, some of which carry burdens of about a hundred weight. Their wool serves to make stuffs, cords, and sacks; their bones are used for the construction of weaver's utensils; and their dung is employed as fuel for dressing meat and warming their huts."*

The mode of killing the vigonias, described by Shelvocke, prevails in Chili and Peru at the present day. It is affirmed that eighty thousand are thus killed every year solely for their wool, and that the species does not appear to diminish.† Gregoire de Bolivar says, that in his time the llamas were so numerous, that four millions were killed every year for their flesh, and that three hundred thousand were employed at the mines of Potosi. The extraordinary multiplication of animal life in South America is familiar to every reader; the Pampas are covered with troops of wild horses, and the oxen are slaughtered by hundreds for their skins alone. In the Memoirs of General Miller, an Englishman in the service of the republic of Peru,

* Kerr's Collection of Voyages, vol x., p. 462.
† Dict. Classique.

it is stated that wood was formerly so scarce and cattle so plentiful, that sheep were driven into the furnaces of limekilns in order to answer the purposes of fuel; and that a decree of the king of Spain, prohibiting this barbarous custom, is still preserved in the archives of Buenos Ayres.

This extraordinary abundance of animal food, and the equal fertility of many districts, where the finest fruits grow spontaneously, and only require the trouble of being gathered, has had a marked effect in retarding the improvement of the natives of South America. They are neither a pastoral nor an agricultural people; and thus, surrounded by partial civilization, they remain without any excitement to labour, which alone could improve their moral and physical condition. Humboldt has beautifully described the state of primitive rudeness in which many of the tribes of South America remain, partly from their geographical position, and partly from the spontaneous bounty of their climate:

"When we attentively examine this wild part of America, we appear to be carried back to the first ages, when the earth was peopled step by step; we seem to assist at the birth of human societies. In the Old World we behold the pastoral life prepare a people of huntsmen for the agricultural life. In the New World, we look in vain for these progressive developments of civilization, these moments of repose, these resting-places in the life of a people. The luxury of vegetation embarrasses the Indian in the chase. As the rivers are like arms of the sea, the depth of the water for many months prevents their fishing. Those species of rumina-

ting animals which constitute the riches of the people of the Old World are wanting in the New. The bison and the musk-ox have not yet been reduced to the domestic state; the enormous multiplication of the llama and the guanaco have not produced in the natives the habits of the pastoral life."

The following is the scientific character of the species, which is indigenous only to South America:

Teeth—Incisors, $\frac{2}{6}$, Canine, $\frac{1}{1}\frac{-}{-}\frac{-}{1}$, Molars, $\frac{5}{4}\frac{-}{-}\frac{6}{4}$.

Total 30.

The two toes separated; the back without a hump; without horns. The female goes with young about six months.

CHAPTER XI.

THE GIRAFFE.

Till the year 1827, when a giraffe arrived in England and another in France, the animal had not been seen in Europe since the end of the fifteenth century, when the Soldan of Egypt sent one to Lorenzo di Medici. This individual was represented in the frescoes at Poggio Acajano,* near Florence, in which city it was very familiar with the inhabitants, living on the fruits of the country, particularly apples, and stretching up its long neck to the first floors of the houses to implore a meal.† There was a giraffe at Rome at the period of Julius Cæsar's dictatorship, which appears to have been the first seen in Europe; the Roman emperors afterward exhibited them in the games of the circus, or in their triumphal processions: Gordian III. had ten living giraffes at one time. The absence of the giraffe from Europe for three centuries and a half naturally induced a belief that the descriptions of this animal were in great part fabulous; that a creature of such extraordinary height and apparent disproportions was not to be found among the actual works of nature; and that it more properly belonged to the group of chimeras with which the re-

* Poggio Acajano is a villa belonging to the Grand-duke of Tuscany, between Florence and Prato.

† Geoffroy St. Hilaire.

Giraffe, Xariffa. *Camelopardalis Giraffa*, LINNÆUS.—*Giraffe*, BUFFON.

gions of imagination are tenanted, the unicorns, and sphinxes, and satyrs, and cynocephali, of ancient poets and naturalists.

The old travellers often mentioned the camelopard in the terms of exaggeration which they naturally derived from the reports of Africans. It was "a beast not often seene, yet very tame, and of a strange composition, mixed of a libard (leopard), harte, buffe, and camel; and by reason of his long legs before and shorter behind, not able to graze without difficulty."* Again, he was "so huge, that a man on horseback may passe uprighte under him, feeding on leaves from the tops of trees, and formed like a camel."† In a very curious Spanish book, however, which describes an embassy from Henry III. of Castile to Tamerlane the Great, in 1403 (being the second sent to Tamerlane by the King of Castile), there is a minute, and, in many respects, accurate account of the giraffe:

"The ambassadors sent by the King of Castile, Henri III., to the Great Tamerlane, arrived at a town called Hoy, now Khoy, on the confines of Armenia, where the Persian empire commences. At that town they fell in with an ambassador, whom the sultan of Babylon had sent to Tamerlane. He had with him as many as twenty horsemen, and fifteen camels, laden with presents, which the sultan sent to Tamerlane. Besides these, there were six ostriches, and an animal called *jornufa* (giraffe), which animal was formed in the following manner: In body it was of the size of a horse, with the neck very long, and the fore legs much taller than the hinder

* Purchas, book vi., chap. i.
† Ibid., book vii., chap. vi.

ones: the hoof was cloven, like that of the ox. From the hoof of the fore leg to the top of the shoulder it was sixteen hands (palmos); and from the shoulders to the head, sixteen hands more; and when it raised its neck, it lifted its head so high as to be a wonder to all. The neck was thin, like that of the stag; and so great was the disproportion of the length of the hinder legs to that of the fore legs, that one who was not acquainted with it would think it was sitting, although it was standing. It had the haunches slanting, like the buffalo, and a white belly. The skin was of a golden hue, and marked with large round white spots. In the lower part of the face it resembled the deer; on the forehead it had a high and pointed prominence; very large and round eyes; and the ears like those of a horse; near the ears, two small round horns, the greater part covered with hair, resembling the horns of deer on their first appearance. Such was the length of the neck, and the animal raised its head so high when he chose, that he could eat with facility from the top of a lofty wall; and from the top of a high tree it could reach to eat the leaves, of which it devoured great quantities. So that altogether it was a marvellous sight to one who had never seen such an animal before."*

Buffon, and other zoologists, fell into the common error of describing the giraffe as having his fore legs twice as long as his hind. It was not till within the last forty years that we obtained any very precise notions of the form and habits of the giraffe; and we principally owe them to Le Vaillant, whose narrative was, indeed, originally con-

* Historia del Grand Tamerlan, &c., Madrid, 1782

sidered, in some degree, fabulous, but the correctness of whose statements in this particular has since been abundantly confirmed. The first encounter of this naturalist with the giraffe is described in such a picturesque manner, that our readers may be pleased with a translation of the passage; he was travelling in Great Namaqua-land:

"I was now struck by a sort of distinction which I perceived on one of the huts; it was entirely covered with the skin of a giraffe. I had never seen this quadruped, the tallest of all those upon the earth; I knew it only from false descriptions and designs, and thus I could scarcely recognise its robe. And yet this *was* the skin of the giraffe. I was in the country which this creature inhabits; I might probably see some living ones: I looked forward to the moment when I should be thus recompensed, at least in part, for all the sufferings and annoyances of my expedition."*

And this enthusiasm was not unnatural in M. le Vaillant. It was a distinction for a European to behold with his own eyes an animal, of whose existence men had begun to doubt. Our own countryman, Burchell, has expressed the same feelings:

"Those who have acquired a taste for zoological information, will readily comprehend in what manner the footmarks of an animal could be interesting, or afford any particular gratification, such as I experienced in this day's journey, when they are told, that we now first distinguished the track of the tallest of all the quadrupeds in the world; of one which, from the time of the Romans until the middle of the last century, was so little known to

* Second Voyage en Afrique, tom. ii., p. 48, 4to, Paris.

the nations of Europe, as to have been at length considered by most people as a fabulous creature, one not existing on the globe. No person who has read even the popular books of natural history could, I think, behold for the first time the ground over which he is walking imprinted with the recent footsteps of a *camelopardalis*, without feeling some strange and peculiar interest at the sight. The animal itself was not observed, but our attention was now awakened by the expectation of soon getting a full view of this extraordinary creature ; and the hope of being the first of the party to see it, kept all my men on the look-out the whole day."*

We return to Le Vaillant :

"One of the Namaquas, who were my guides, came in great haste to give me information which he thought would be agreeable to me. He had seen the strong feeling of pleasure which I had evinced at the sight of the skin of the giraffe ; and he had run to say that he had just found in the neighbourhood one of these animals under a mimosa, the leaves of which he was browsing upon. In an instant, full of joy, I leaped upon my horse ; I made Bernfry (one of his men) mount another, and, followed by my dogs, I flew towards the mimosa. The giraffe was no longer there. We saw her cross the plain towards the west, and we hastened to overtake her. She was proceeding at a smart trot, but did not appear to be at all hurried. We galloped after her, and occasionally fired our muskets ; but she insensibly gained so much upon us, that, after having pursued her for three hours, we were forced to stop, because our horses were quite

* Travels in Southern Africa, vol. ii., p. 248.

out of breath, and we entirely lost sight of her. . . The pursuit had led us far away from each other and from the camp; and the giraffe having made many turns and doubles, I was unable to direct my course towards home. It was noon. I already began to feel hunger and thirst; and I found myself alone, in a steril and arid spot, exposed to a burning sun, without the least shelter from the heat, and destitute of food." The traveller, however, shot and cooked some birds of the partridge genus; and was fortunate to rejoin his companions in the evening. "The next morning my whole caravan joined me again. I saw five other giraffes, to which I gave chase; but they employed so many stratagems to escape, that, after having pursued them the whole day, we entirely lost them as the night came on. I was in despair at this ill success. . . . . The next day, the 10th of November, was the happiest of my life. By sunrise I was in pursuit of game, in the hope to obtain some provisions for my men. After several hours' fatigue, we descried, at the turn of a hill, seven giraffes, which my pack instantly pursued. Six of them went off together; but the seventh, cut off by the dogs, took another way. Bernfry was walking by the side of his horse, but in the twinkling of an eye he was in the saddle, and pursued the six. For myself, I followed the single one at full speed; but, in spite of the efforts of my horse, she got so much ahead of me, that, in turning a little hill, I lost sight of her altogether, and I gave up the pursuit. My dogs, however, were not so easily exhausted. They were soon so close upon her that she was obliged to stop to defend herself. From the place

where I was I heard them give tongue with all their might; and, as their voices appeared all to come from the same spot, I conjectured that they had got the animal in a corner, and I again pushed forward. I had scarcely got round the hill, when I perceived her surrounded by the dogs, and endeavouring to drive them away by heavy kicks. In a moment I was on my feet, and a shot from my carbine brought her to the earth. Enchanted with my victory, I returned to call my people about me, that they might assist in skinning and cutting up the animal. While I was looking for them, I saw Klaas Baster (another of his men), who kept making signals which I could not comprehend. At length I went the way he pointed, and, to my surprise, saw a giraffe standing under a large ebony-tree, assailed by my dogs. It was the animal I had shot, who had staggered to this place; and it fell dead at the moment I was about to take a second shot.

"Who could have believed that a conquest like this would have excited me to a transport almost approaching to madness! Pains, fatigues, cruel privation, uncertainty as to the future, disgust sometimes as to the past; all these recollections and feelings fled at the sight of this new prey. I could not satisfy my desire to contemplate it. I measured its enormous height. I looked from the animal to the instrument which had destroyed it. I called and recalled my people about me. Although we had combated together the largest and most dangerous animals, it was I alone who had killed the giraffe. I was now able to add to the riches of natural history; I was now able to destroy the romance which attached to this animal,

and to establish a truth. My people congratulated me on my triumph. Bernfry alone was absent; but he came at last, walking at a slow pace, and holding his horse by the bridle. He had fallen from his seat and injured his shoulder. I heard not what he said to me. I saw not that he wanted assistance; I spoke to him only of my victory. He showed me his shoulder; I showed him my giraffe. I was intoxicated, and I should not have thought even of my own wounds."*

"The giraffe," says Le Vaillant, "ruminates, as every animal does that possesses, at the same time, horns and cloven feet. It grazes also in the same way; but not often, because the country which it inhabits has little pasturage. Its ordinary food is the leaf of a sort of mimosa, called by the natives *kanaap*, and by the colonists *kameeldoorn*. This tree being only found in the country of the Namaquas, may probably afford a reason why the giraffe is there fixed, and why he is not seen in those regions of Southern Africa where the tree does not grow.

"Doubtless the most beautiful part of his body is the head. The mouth is small; the eyes are brilliant and full. Between the eyes and above the nose is a swelling, very prominent and well defined. This prominence is not a fleshy excrescence, but an enlargement of the bony substance; and it seems to be similar to the two little lumps or protuberances with which the top of his head is armed, and which, being about the size of a hen's egg, spring, on each side, at the commencement of the mane. The two jaws have on each side six

* Second Voyage, tom. ii., p. 54.

molar teeth; but the lower jaw has, beyond these, eight incisive teeth, while the upper jaw has none.

"The hoofs, which are cleft and have no nails, resemble those of the ox. We may remark, at first sight, that those of the fore feet are larger than those of the hind. The leg is very slender, but the knees have a prominence, because the animal kneels when he lies down. There is also a larger callosity on the breast, which would lead one to conclude that he generally rests on that part.

"If I had not myself killed the giraffe, I should have believed, as have many naturalists, that the fore legs are much longer than the hind. This is an error; for the legs have, in general, the proportion of those of other quadrupeds. I say in general, because in this genus there are varieties, as there are in animals of the same species. Thus, for example, mares are lower before than stallions of an equal height. What has led to this error as to the difference between the legs of the giraffe, is the height of the withers, which, according to the animal's age, may exceed the height of the rump by sixteen or twenty inches, and which disproportion, when we see it at a distance, must have led to the belief that its legs were longer before than behind. . . . . His defence, as that of the horse and other hoofed animals, consists in kicks; and his hinder limbs are so light and his blows so rapid, that the eye cannot follow them. They are sufficient for his defence against the lion. He never employs his horns in resisting any attack. . . . . The giraffes, male and female, resemble each other in their exterior in their youth. Their obtuse horns are then terminated by a knot of long hair:

the female preserves this peculiarity some time, but the male loses it at the age of three years. The hide, which is at first of a light red, becomes of a deeper colour as the animal advances in age, and is at length of a yellow brown in the female, and of a brown approaching to black in the male. By this difference of colour the male may be distinguished from the female at a distance. The skin varies in both sexes, as to the distribution and form of the spots. The female is not so high as the male, and the prominence of the front is not so marked. She has four teats. According to the account of the natives, she goes with young about twelve months, and has one at a birth."

The mode in which it lays hold of the succulent branches of trees, and many of its other motions,

are shown in the annexed sketch, from the pencil of Mr. Agasse.

The differences between individuals of the same species of animals—to say nothing of varieties—have ordinarily produced considerable contradiction in the statements of the most accurate observers. Thus Mr. Davis, who regarded the giraffe as one accustomed to the movements of animals, differs from M. Geoffroy St. Hilaire with regard to the pace of the giraffe. Again, M. Acerbi, who saw both the giraffes of England and France at Alexandria, as well as two others, differs from Mr. Davis as to the difficulty which the animal may feel in reaching to the ground. In a published letter, he says, "there are few naturalists who have not contributed to perpetuate the vulgar error, that 'in eating and drinking from the ground, the giraffe is compelled to stretch his fore legs *amazingly* forward.' Some even assert that 'he is obliged to kneel down.' Of the four animals which fell under my examination, three took their food from the ground with comparative facility; and one of them was scarcely under the necessity of moving its fore legs at all. . . . . I should infer that every giraffe, in a natural state, is enabled to eat or drink from the ground without inconvenience; and that, where any difficulty exists in this respect, it is the effect of habit, acquired in the progress of domestication."

These contradictions in minute points are sometimes startling; but it is to be remembered that even the same animal is to be seen in different circumstances. Sir Everard Home fancied that the giraffe preferred licking the hand of a lady to that of a man; Mr. Davis tells us he never saw any such exhibition of politeness. In one point all the observers of the European giraffes agree, that they

never make any noise whatever. Farther, they appear to consider that the animal would be useless to man in a state of domestication. M. Acerbi has an anecdote illustrative of this point:

"When at Alexandria, I had one day ordered the two giraffes (a male and female) taken at Darfûr to be led up and down the square in front of my house: among the crowd collected on the occasion were some Bedouins of the Desert. On inquiring of one of them whether he had ever seen similar animals before, he replied that he had not; and I then asked him in Arabic, 'Taib di? Do they please you?' To which he rejoined, 'Mustaib,' or, 'I do not like them.' Having desired my interpreter to inquire the motives of his disapproval, he answered, 'that it did not carry like a horse; it did not serve for field labours like an ox; did not yield hair like a camel, nor flesh and milk like a goat; and on this account it was not to his liking.'"

After all, it is a narrow view of the economy of Providence, and perhaps a selfish one, to limit our notions of the use of any being in the wide field of creation by a reference to its ability to furnish benefits to ourselves. That they all advance some wise purpose in the arrangement of the world, is evident from the care which has been observed to provide every species with the means for its preservation. Those which are weak, and liable to be destroyed by numberless enemies, have an extraordinary fecundity; those which are powerful and dangerous multiply very slowly; and though their existence depends upon precarious supplies, they have wonderful powers of availing themselves of the food destined to their peculiar natures; those

which are gregarious have in their combinations an adequate protection against the ordinary attacks of the fiercer beasts; and those which are few in number, such as the giraffe, have the means of obtaining food in a peculiar manner; live in solitary districts, where the wants of pasture neither brings the herd nor their destroyers; and have great quickness of sight and hearing, and the ability of rapid flight. Among the peculiarities by which the giraffe is enabled to secure his race from the attacks of the stronger, is the construction of his eye, by which he can see his enemy on every side.

The *teeth* of the giraffe are, in number and arrangement, as follows:

Incisors, $\frac{0}{8}$, Canine, $\frac{0}{0}-\frac{0}{0}$, Molar, $\frac{6}{6}-\frac{6}{6}$. Total, 32.

CHAPTER XII.

ANTELOPES.

The Giraffe is classed among naturalists in the same great division with the Deer and the Antelope. Each of these genera are described as ruminants, having either permanent horns on their heads, or bony substances which fall off and are renewed.

1. The first tribe, the deer, has bony substances, generally branched, which fall off annually, and are annually renewed, of a larger size than the pre-

ceding year, always existing on the head of the male, and sometimes on the head of the female.

2. The giraffe forms the second tribe, which is distinguished by having horns or prominences on the frontal bone, covered with a soft skin, which is a continuation of the skin of the head. These horns exist in both sexes, and are permanent.

3. The third tribe, the antelope, is marked by the prominences of the frontal bone being covered with a sheath of horn, composed of hardened fibres, which grows in layers, and increases during the whole life.

We thus see that the antlers of the deer are formed of bone, and annually fall off and are renewed; that the prominences of the giraffe are covered over with the skin of the forehead; and that the horns of the antelopes are hard sheaths, which are permanent, and increase in size every year.

Buffon considered that the age of an antelope was indicated by the number of rings on his horn. This was an error; for Pallas has shown, that although there is a real augmentation of the number of rings as the animal advances in age, yet as the horns increase less and less as the animal becomes older, there is no equal relation between the progress of life and the growth of the horn.

With the exception of four species, *A. Gazella*, *A. caama*, *A. oryx*, and *A. Cucophæa*, the females of the antelope tribe have no horns.

Almost all the tribe of antelopes are of a gentle and social nature. In general, with the exception of many of the smaller species of Southern Africa, they live in large herds. Their sight, their hearing, and their smell, are of extreme delicacy

From the proportion of the volume of the auditory cavity, which determines the power of the sense of hearing, the ear of the antelope has a greater quickness than that of any other ruminating animal. The nylghau, the gnu, and the chamois, are exceptions to this superiority, as regards the development of the auditory cavity; and this may arise from the former inhabiting plains, where they are more exposed to danger, and the latter living in places less accessible by their enemies.

The name of antelope, although it appears of Greek origin, was not used by the ancients. In a work attributed to Eustathius,* who lived in the time of Constantine, the name of *antholopos* is applied to an animal with long horns, jagged like a saw.† Many writers of the middle ages have applied to the same animal the designations of *antholopos*, *antaplos*, and *aptalos*. It is conjectured that this animal was the oryx, a species of antelope which, according to a fabulous notion, had only one horn. *Panthalops*, in the old language of Egypt, was the unicorn. It is supposed by comparative anatomists that the rhinoceros was the unicorn of Scripture.

The most elegant of antelopes is the gazelle. Its height is twenty inches, and its length from head to tail twenty-two inches. Its skin is beautifully sleek, its body extremely graceful, its head peculiarly light, its ears highly flexible, its eyes most brilliant and glancing, and its legs as slender as a reed. The Arabian poets have applied their choicest epithets to the beauty of the gazelle, and

* Not the Commentator on Homer. † Cuvier.

The Gazelle. Antilope Doreas, BUFFON.

their descriptions have been adopted into our own poetry. Byron has adopted the image in speaking of the dark eyes of an Eastern beauty :

"Go look on those of the gazelle."

When the Arabian describes his mistress, she is "an antelope in beauty;" "his gazelle employs all his soul;" and thus, in their figurative language, perfect beauty and gazelle beauty are synonymous.

These animals are spread, in innumerable herds, from Arabia to the river Senegal, in Africa. Lions and panthers feed upon them; and man chaces them with the dog, the ounce, and the falcon.

Antilope Pygarga, PALLAS.

The beautiful animal of which the above is a representation was exhibited at Exeter Change, London, in 1828. It was called by its keepers the *Lyre-Antelope*, but many of the gazelles have their horns in the form from which this name was given. The rings upon the horns, which are very decided, form a marked characteristic of this species. It was considerably larger than the gazelle, being about three feet high. The *Pygarga*, to which species we have reason to think this individual ante-

lope belonged, inhabits Southern Africa and parts of Asia.

The *Springbok* (the *Antilope euchore* of Burchell) is well known to the colonists at the Cape. "It is easily distinguished," says Burchell, "from all the known species, by the very long white hair along the middle of the back, which, lying flat, is nearly concealed by the fur on each side, and is expanded only when it takes those extraordinary leaps which first suggested its name." Mr. Burchell's description of a herd of springboks is very picturesque:

"At this high level we entered upon a very extensive, open plain, abounding to an incredible degree in wild animals; among which were several large herds of quakkas, and many *wilde-beests* or *gnues*: but the *springbucks* were far the most numerous, and, like flocks of sheep, completely covered several parts of the plain. Their uncertain movements rendered it impossible to estimate their number; but, I believe, if I were to guess it at two thousand, I should still be within the truth. This is one of the most beautiful of the antelopes of Southern Africa; and it is certainly one of the most numerous. The plain afforded no other object to fix the attention; and even if it had presented many, I should not readily have ceased admiring those elegant animals, or have been diverted from watching their manners. It was only occasionally that they took those remarkable leaps, which have been the origin of the name; but, when grazing or moving at leisure, they walked or trotted like other antelopes, or as the common deer. When pursued, or hastening their pace, they fre-

quently took an extraordinary bound, rising with curved or elevated backs high into the air, generally to the height of eight feet, and appearing as if about to take flight. Some of the herds moved by us almost within musket shot; and I observed that in crossing the beaten road, the greater number cleared it by one of those flying leaps. As the road was quite smooth and level with the plain, there was no necessity for their leaping over it; but it seemed that the fear of a snare, or a natural disposition to regard man as an enemy, induced them to mistrust even the ground which he had trodden."*

The migrations of innumerable companies of springboks, from unknown regions in the interior of Africa to the abodes of civilization, are among the most extraordinary examples of the fecundity of animal life. The vast quantity of a species of birds of South America, which produce the *guano* (a manure) in sufficient abundance to be a great article of commerce; the flocks of pigeons of North America, the locusts of Africa, are not more striking than the herds of springboks. They do not come alone to the cultivated plains. "The lion has been seen to migrate, and walk in the midst of the compressed phalanx, with only as much room between him and his victims as the fears of those immediately around could procure by pressing outward."† The immense migratory swarms of these animals, which occasionally pour themselves like a deluge from the Bushman territory upon the northern frontiers of the Cape colony, have never been

* Travels in Southern Africa, vol. ii., p. 109.
† Cuvier's Animal Kingdom, by Griffiths, vol. iv., p. 209.

more vividly described than by Captain Stockenstrom, the chief civil commissioner at the Cape.

He says, "It is scarcely possible for a person passing over some of the extensive tracts of the interior, and admiring that elegant antelope the springbok, thinly scattered over the plains, and bounding in playful innocence, to figure to himself that these ornaments of the desert can often become as destructive as the locusts themselves. The incredible numbers which sometimes pour in from the north during protracted droughts, distress the farmer inconceivably. Any attempt at numerical computation would be vain; and by trying to come near the truth the writer would subject himself, in the eyes of those who have no knowledge of the country, to a suspicion that he was availing himself of a traveller's assumed privilege. Yet it is well known in the interior, that on the approach of the *Trek-bokken* (as these migratory swarms are called), the grazier makes up his mind to look for pasture for his flocks elsewhere, and considers himself entirely dispossessed of his lands until heavy rains fall. Every attempt to save the cultivated fields, if they be not enclosed by high and thick hedges, proves abortive. Heaps of dry manure (the fuel of the Sneeuwbergen and other parts) are placed close to each other round the fields, and set on fire in the evening, so as to cause a dense smoke, by which it is hoped the antelopes will be deterred from their inroads; but the dawn of day exposes the inefficacy of the precaution, by showing the lands, which appeared proud of their promising verdure the evening before, covered with thousands, and reaped level with the ground. In-

stances have been known of some of those prodigious droves passing through flocks of sheep, and numbers of the latter carried along with the torrent, being lost to the owners, and becoming a prey to the wild beasts. As long as these droughts last, their inroads and depredations continue; and the havoc committed upon them is of course great, as they constitute the food of all classes: but no sooner do the rains fall than they disappear, and in a few days become as scarce on the northern borders as in the more protected districts of Bruintjes-Hoogte and Camdeboo.

"The African colonists themselves can form no conception of the cause of the extraordinary appearance of these animals; and, from their not being able to account for it, those who have not been eyewitnesses of such scenes consider their accounts exaggerated; but a little more minute inspection of the country south of the Orange River solves the difficulty at once. The immense desert tracts between that river and our colony, westward of the Zeekoe River, though destitute of permanent springs, and, therefore, uninhabitable by human beings for any length of time, are, notwithstanding, interspersed with stagnant pools and *vleys*, or natural reservoirs of brackish water, which, however bad, satisfies the game. In these endless plains, the springboks multiply, undisturbed by the hunter (except when occasionally the Bosjesman destroys a few with his poisoned arrows), until the country literally swarms with them; when, perhaps, one year out of four or five, a lasting drought leaves the pools exhausted, and parches up the soil, naturally inclined to sterility. Thus want, principally

of water, drives those myriads of animals either to the Orange River or to the colony, when they intrude in the manner above described. But when the bountiful thunder-clouds pour their torrents upon our burned-up country, reanimating vegetation, and restoring plenty to all graminivorous animals, then, when we could, perhaps, afford to harbour those unwelcome visiters, their own instinct and our persecutions propel them again to their more steril but peaceful and secluded plains, to recruit the numbers lost during their migration, and to resume their attacks upon us when their necessities shall again compel them."

Upon this interesting subject we are favoured with some original remarks by Mr. Pringle:

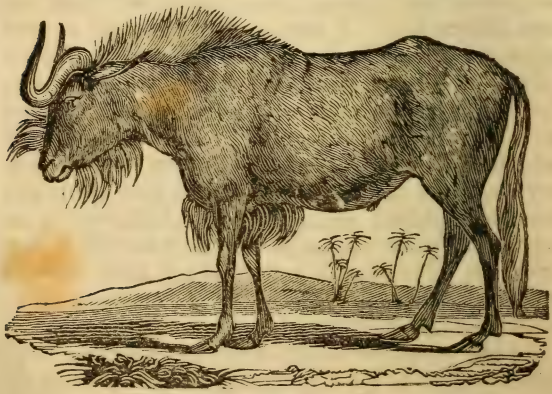
"To the above description of the migratory swarms of springboks, I have little to add from my own observation. I once passed through a most astonishing multitude, scattered over the grassy plains near the Little Fish River. I could not, for my own part, profess to estimate their number with any degree of accuracy; but they literally *whitened*, or rather *speckled*, the face of the country as far as the eye could reach over those far-stretching plains; and a gentleman, better acquainted than myself with such scenes, who was riding with me, affirmed that we could not have fewer of these animals at one time under our eye than twenty-five or thirty thousand.

"I am not aware whether any species of antelope nearly allied to the springbok is to be found in the northern parts of Africa or in Palestine; but it is a singular circumstance, that the name of this animal, in the Bichuana language (*tzebe*), is precisely the

same as that used in the Song of Solomon to designate an animal of the antelope family, erroneously rendered *roe* in our translation.*

"The springbok is easily tamed when caught young. I have seen it, in several places, reared as a plaything for the children, at the farms of the colonists, sometimes playing like a pet lamb about the doors, among the numerous swarms of dogs and poultry; in other instances accompanying the flocks of sheep and goats to pasture, and returning as regularly and quietly as the rest.

"Such facts demonstrate how easy it would be, with a little care and management, to enlarge the list of domesticated animals, by adding to them many species of such as are at present considered the most shy and impracticable."



The Gnu. Antilope Gnus, BUFFON.

In the well-arranged menagerie of Mr. Cross,

* Chap. ii., 9-17.

London, there are two fine specimens of the male and female gnu. The preceding, is a portrait of the male. These individuals are tolerably gentle, but somewhat uncertain in their tempers.

We are indebted to Mr. Pringle for the following account of this animal, as seen by him in its native regions:

"The curious animal called *gnu* by the Hottentots, *wilde beest* (*i. e.*, wild ox) by the Dutch colonists, was an inhabitant of the mountains adjoining the Scottish settlement at Bavian's River, and I had therefore opportunities of very frequently seeing it both singly and in small herds. Though usually, and perhaps correctly, by naturalists ranked among the antelope race, it appears to form, evidently, one of those intermediate links which connect, as it were, the various tribes of animals in a harmonious system in the beautiful arrangement of nature. As the *hyæna* dog, or '*wilde hond*,' of South Africa connects the dog and wolf tribe with that of the hyæna, in like manner does the gnu form a graceful link between the buffalo and the antelope. Possessing the distinct features which, according to naturalists, are peculiar to the latter tribe, the gnu exhibits, at the same time, in his general aspect, figure, motions, and even the texture and taste of his flesh, qualities which partake very strongly of the bovine character. Among other peculiarities I observed that, like the buffalo or the ox, he is strangely affected by the sight of scarlet; and it was one of our amusements, when approaching these animals, to hoist a red handkerchief on a pole, and to observe them caper about, lashing their flanks with their long tails, and tearing up the

ground with their hoofs, as if they were violently excited, and ready to rush down upon us; and then all at once, when we were about to fire upon them, to see them bound away, and again go prancing round us at a safer distance. When wounded, they are reported to be sometimes rather dangerous to the huntsman; but, though we shot several at different times, I never witnessed any instance of this. On one occasion a young one, apparently only a week or two old, whose mother had been shot, followed the huntsman home, and I attempted to raise it on cow's milk. In a few days it appeared quite as tame as a common calf, and seemed to be thriving; but afterward, from some unknown cause, it sickened and died. I heard, however, of more than one instance in that part of the colony, where the gnu, thus caught young, had been reared with the domestic cattle, and had become so tame as to go regularly out to pasture with the herds, without exhibiting any inclination to resume its natural freedom; but, in consequence of a tendency which the farmers say they evinced to catch and to communicate to the cattle a dangerous infection, the practice of rearing them as curiosities has been abandoned. I know not if this imputation be correct, but it is true that infectious disorders do occasionally prevail to a most destructive extent among the wild as well as the domesticated animals in South Africa, and especially among the tribes of larger antelopes.

"There is another species of gnu found farther to the northward, of which I saw a single specimen in the colony, which, in the shape of the horns and some other particulars, still more resembles

the ox. This specimen has been described by Burchell under the name of *antilope taurina*."

The Gnu's Head.

Mr. Pringle has furnished us with the following description of the *hartebeest* (*antilope bubalis*), which also came under his observation.

"The hartebeest is one of the largest and handsomest of the antelope family. It is nearly of the same height as the gnu, but of a more slender and elegant shape. It was pretty numerous on the mountains around our settlement, and not unfrequently furnished us with game. It had many other enemies, I observed, and some of them only less formidable than man, the great destroyer. In the nooks of the narrow ravines, through which the wild game are wont to descend from the steep and stony mountains, for change of pasturage, or to drink at the fountains that ooze from their declivities, I have frequently found fresh sculls and horns of the hartebeest, those slight relics being all that remained to indicate that there the lion had surprised and rent his prey, and that the voracious

hyæna had followed and feasted on the fragments, devouring even the bones, except the scull and a few other unmanageable portions. Though the common hyæna is no match in speed for the fleet full-grown hartebeest, he probably picks up many of the young ones, and is always sure at least of the aged or infirm. The hyæna dog is probably still more destructive. Too slender to attack such an animal as the hartebeest individually, these 'dogs of the desert' associate themselves in packs to hunt down this and the other large antelopes. I once witnessed a chase of this kind, in which a noble hartebeest, hard pressed by a troop of these 'wilde-honden' (as the boors call them), dashed across our garden and orchard ground, and onward among our huts, at noonday. The wild dogs, on hearing the halloo that was raised by some of the people who witnessed this scene, stayed their quest for a brief space, as if alarmed; but, before we could get a gun or two to attack them, they vigorously renewed the chase down the valley, making a small circuit to avoid the houses; and, as the poor antelope seemed sore spent, I have no doubt that he would be speedily run down, notwithstanding the slight advantage he gained by our interference.

"The largest of all the South African antelopes, the Oreas, called by the colonists the eland or elk, was also an inhabitant of our mountains, though more rare than the gnu or hartebeest. This animal, though different in figure, is nearly as large in size as an ordinary ox. It is a timid and harmless animal, and neither so swift nor so elegant as

most of those of its tribe that I have mentioned. When fat it runs so sluggishly that the boors in hunting it will frequently ride close up, and, without expending a single shot, stab it with their hunting-knives. Its flesh is not so dry as that of most of the antelope tribe, and approaches more to the flavour and quality of beef. From its value in this respect, and its large size, combined with its deficiency in means of self-protection, this animal is now become very rare, even in the remotest parts of the Cape Colony; and, in a short period, will probably be altogether extirpated within its limits."

A few years ago the king had several Chamois in Windsor Great Park, but they soon died. In the following page is a portrait of one of those individuals.

The chamois inhabits the most inaccessible parts of the woody regions of the great mountains of Europe. He does not, as the bouquetin, climb to their most pointed summits, and he descends not into the plains. Like the klipspringer of the Cape, he is remarkable for the wonderful extent and precision of his leaps. He bounds over the chasms of rocks; he springs from one projection to another with unerring certainty; he throws himself from a height of twenty or even thirty yards upon the smallest ledge, where there is scarcely room for his feet to plant themselves. This extraordinary power of balancing the body—of instantly finding the centre of gravity—is a peculiarity of all the goat tribe, to which the chamois is nearly allied. The ability of the eye to measure distances with such undeviating exactness is associated with this

The Chamois. Antilope Rupicapra, BUFFON.

power of finding the centre of gravity. In the chamois these are instinctive faculties, which he possesses almost from the moment of his birth. They are not the result of training; for the young chamois has only to acquire the necessary strength to be able to imitate the feats of his more practised companions. How different is the process by which man obtains the full exercise of his physical powers! The awkward efforts of the infant for the first two years of his life are principally directed to the acquisition of the ability, by constant experiments, of poising his body, of ascertaining the size and relative position of objects by the touch,

and of measuring distances by the eye. Throughout life, we cannot be placed in a new situation, in which the exercise of these faculties is demanded, without feeling how completely our powers are the result of experience. We walk safely and easily upon a plane surface, because we have learned to do so; but if we slip from any elevation upon a narrow ledge, with what extreme difficulty do we maintain our footing! Yet another man, possessing originally no greater ability of balancing his body, runs along a parapet without fear or danger. Again, we are constantly mistrusting the distance and size of objects. The accuracy of the eye entirely depends upon its practice. To one unaccustomed to the sea, a ship upon the horizon appears at no great distance; the sailor can tell that it is far away, and, pretty nearly, how many miles it is off. The practice which is necessary to the exercise of human vision is indeed wonderful; but the faculty is so gradually acquired, that we may easily deceive ourselves into the belief that it is instinctive. Dr. Thomas Brown has put this strongly in his lectures: "In those striking cases which are sometimes presented to us, of the acquisition of sight in mature life, in consequence of a surgical operation, after vision had been obstructed from infancy, it has been found that the actual magnitude and figure, and position of bodies, were to be learned like a new language; that all objects seemed equally close to the eye; and that a sphere and a cube, of each of which the tangible figure was previously known, were not so distinguishable in the mere sensation of vision, that the one could be said with certainty to be the cube, and the other the sphere.

In short, what has been supposed, with every appearance of probability, was demonstrated by experiment—that we learn to see."*

And yet man, by constant training, may attain an excellence in the employment of his senses very little inferior to the instinctive powers of the lower animals. The chamois hunters of the Alps are remarkable examples of what he may accomplish by courage, perseverance, and constant experiment. If man fairly bring his physical powers and his mechanical aids into a contest even with such surprising faculties as the chamois possesses, the triumph is his; and this triumph shows us that there are few things beyond the reach of human energy.

The chamois hunter sets out upon his expedition of fatigue and danger generally in the night. His object is to find himself at the break of day in the most elevated pastures, where the chamois comes to feed before the flocks shall have arrived there. The chamois feeds only at morning and evening. When the hunter has nearly reached the spot where he expects to find his prey, he reconnoitres with a telescope. If he finds not the chamois, he mounts still higher; but if he discovers him, he endeavours to climb above him and to get nearer, by passing round some ravine, or gliding behind some eminence or rock. When he is near enough to distinguish the horns of the animal (which are small, round, pointed, and bent backward like a hook, as in the portrait) he rests his rifle upon a rock, and takes his aim with great coolness. He rarely misses. This rifle is often double-barrelled. If the chamois falls, he runs to his prey, makes

* Lecture xxviii.

sure of him by cutting the hamstrings, and applies himself to consider by what way he may best regain his village. If the route is very difficult, he contents himself with skinning the chamois; but if the way is at all practicable with a load, he throws the animal over his shoulder, and bears it home to his family, undaunted by the distance he has to go, and the precipices he has to cross.

But when, as is more frequently the case, the vigilant animal perceives the hunter, he flies with the greatest swiftness into the glaciers, leaping with incredible speed over the frozen snows and pointed rocks. It is particularly difficult to approach the chamois when there are many together. While the herd graze, one of them is planted as a sentinel on the point of some rock, which commands all the avenues of their pasturage; and when he perceives an object of alarm, he makes a sharp hissing noise, at the sound of which all the rest run towards him, to judge for themselves of the nature of the danger. If they discover a beast of prey or a hunter, the most experienced puts himself at their head; and they bound along, one after the other, into the most inaccessible places.

It is then that the labours of the hunter commence; for then, carried away by the excitement, he knows no danger. He crosses the snows without thinking of the abysses which they may cover; he plunges into the most dangerous passes of the mountains; he climbs up, he leaps from rock to rock, without considering how he can return. The night often finds him in the heat of the pursuit; but he does not give it up for this obstacle. He considers that the chamois will stop during the dark-

ness as well as himself, and that on the morrow he may again reach them. He passes then the night, not at the foot of a tree, nor in a cave covered with verdure, as does the hunter of the plain, but upon a naked rock, or upon a heap of rough stones, without any sort of shelter. He is alone, without fire, without light; but he takes from his bag a bit of cheese and some of the barley-bread which is his ordinary food—bread so hard that he is obliged to break it between two stones, or to cleave it with the axe which he always carries with him to cut steps which shall serve for his ladder up the rocks of ice. His frugal meal being soon ended, he puts a stone under his head, and is presently asleep, dreaming of the way the chamois has taken. He is awakened by the freshness of the morning air; he arises, pierced through with cold; he measures with his eyes the precipices which he must yet climb to reach the chamois; he drinks a little brandy (of which he always carries a small provision), throws his bag across his shoulder, and again rushes forward to encounter new dangers. These daring and persevering hunters often remain whole days in the dreariest solitudes of the glaciers of Chamouni; and during this time their families, and, above all, their unhappy wives, feel the keenest alarm for their safety.

And yet, with the full knowledge of the dangers to be encountered, the chase of the chamois is the object of an insurmountable passion. Saussure knew a handsome young man, of the district of Chamouni, who was about to be married; and the adventurous hunter thus addressed the naturalist: "My grandfather was killed in the chase of the

chamois; my father was killed also; and I am so certain that I shall be killed also, that I call this bag, which I always carry hunting, my winding-sheet; I am sure that I shall have no other; and yet, if you were to offer to make my fortune upon the condition that I should renounce the chase of the chamois, I should refuse your kindness." Saussure adds, that he went several journeys in the Alps with this young man; that he possessed astonishing skill and strength; but that his temerity was greater than either; and that, two years afterward, he met the fate which he had anticipated, by his foot failing on the brink of a precipice to which he had leaped. It is the chase itself which attracts these people more than the value of the prey; it is the alternation of hope and fear, the continual excitement, the very dangers themselves, which render the chamois-hunter indifferent to all other pleasures. The same passion for hardy adventure constitutes the chief charm of the soldier's and sailor's life; and, like all other passions, to be safe and innocent, it must be indulged in great moderation, near akin as it is to one of our most senseless and mischievous propensities, gambling.

The very few individuals of those who grow old in this trade bear on their countenances the traces of the life which they have led. They have a wild, and somewhat haggard and desperate air, by which they may be recognised in the midst of a crowd. Many of the superstitious peasants believe that they are sorcerers; that they have commerce with the evil spirit, and that it is he that throws them over the precipices. When the enormous glaciers and summits of Mont Blanc are beheld from the val-

leys, it is indeed almost miraculous that any mortal should be found hardy enough to climb them; and it is not unnatural that a simple peasantry should believe that something above human excitement had inspired these perilous undertakings. To the traveller, or to the native of the vale of Chamouni, Mont Blanc is an object of awe and astonishment; and the devotion of the instructed, and the superstition of the unenlightend, are perhaps equally attributes to the God of nature, when they thus look upon one of the grandest of natural objects,

"The dread ambassador from earth to heaven."

The chamois is now getting rare in Switzerland, in consequence of the inhabitants being allowed to hunt him at all seasons; but the race may be expected again to multiply, as the old regulations for determining the periods of hunting are again introduced. They are rarely caught alive, and can only be tamed when taken very young.

CHAPTER XIV.

DEER.

The Red Deer.

AFTER the account we have given of the hunting of the chamois, where the antelope is fairly pitted against the man; strength for strength, strata-

gem for stratagem, and danger for danger, how poor must our modern huntings appear! A field of eager sportsmen, fortified against a little fatigue by every excitement of a morning meal, and mounted upon the swiftest and surest horses, meet to pursue a stag, that is brought to some favourable spot in a cart. The poor creature has probably been hunted several times before; for it is the object of the huntsman to save him from the dogs if possible, that he may be again tormented. But he well remembers the first fearful cry of the distant hounds; he hears again the encouraging voices of the men; the clatter of horses' feet ring again in his ear; he dreads that he shall find no river to baffle his followers, who must ride to the nearest bridge, while he swims fearlessly across the stream; he recollects that the sheltering wood was no protection to him, and that the dogs followed him even to the shelter of the peasant's hovel, when he threw himself upon man for succour: he was rescued, it is true, from their devouring teeth; but he felt all the agonies of anticipated death. And can the creature thus renew such feelings without intense suffering, or his pursuers so excite them without cruelty? In spite of all the trappings of modern stag-hunting, it is just as unworthy in its principle as the bull-baitings and dog-fights of the populace; for its object is the same—the torture of an unoffending creature for our own amusement. Emulation in horsemanship is indeed pleasurable and useful; but it is injurious in the moral sense to purchase any advantage or gratification by the infliction of unnecessary misery upon an inferior being.

The various species of deer, as well as the antelopes, remain invariably in their original situation when left in a state of nature. Two species are common to the north of the old and the new continents; five belong to North America; four to America, south of the equator; four to Europe and the continent of Asia; and fourteen to India, to China, and to the Archipelagoes of the south-east of Asia.

Of the British deer, the only existing species are the red deer (*Cervus Elaphus*), the roe (*Cervus Capreolus*), and the fallow deer (*Cervus Dama*).

The red deer is about three and a half feet in height; the female goes with young eight months, and produces one at a birth; the horns are branched, round, and recurved.

The roe is about two and a quarter feet high; the female goes with young five months and a half, and produces two at a birth; the horns are branched, round, erect, with bifid summits.

The fallow deer, the most gentle of the deer tribe, is smaller than the red deer; the female goes with young eight months, and produces one or two, and sometimes (though rarely) three at a birth. The horns are branched, recurved, compressed, and palmated at the top.

The antlers of the deer fall off, and are annually renewed. This peculiarity is a most singular provision of nature; and the mode in which the process is effected offers many examples of animal economy. We transcribe a description of the process from Blumenbach's "Comparative Anatomy:"

"The annual reproduction of horns constitutes, in many points of view, one of the most remarka-

ble phenomena of animal physiology. It affords a most striking proof, first, of the power of the nutritive process, and of the rapid growth which results from this process in warm-blooded animals; for the horn of a stag, which may weigh a quarter of a hundred weight, is completely formed in ten weeks; secondly, of the remarkable power of absorption, by which, towards the time of shedding the old horn, a complete separation is effected of the substance which was before so firmly united with the frontal bone; thirdly, of a limited duration of life in a part of an animal entirely independent of the life of the whole animal, which in the stag extends to about thirty years; fourthly, of a change of calibre in particular vessels; for the branches of the external carotid, which supply the horn, are surprisingly dilated during its growth, and recover their former dimensions when that process has ceased; fifthly, of a peculiar sympathy which is manifested between the growth of the horns and the generative functions."

The translators of Blumenbach have added the following note, in illustration of these curious physiological facts:

"The word *horn*, which is frequently applied in English to the *antlers* of the deer kind, as well as to the real horns of other genera, would lead to very erroneous notions on this subject. The *antler* is a real bone; it is formed in the same manner, and consists of the same elements, as other bones; its structure is also the same.

"It adheres to the frontal bone by its basis; and the substance of the two parts being consolidated together, no distinction can be traced when the

antler is completely organized. But the skin of the forehead terminates at its basis, which is marked by an irregular projecting bony circle ; and there is neither skin nor periosteum on the rest of it. The time of its remaining on the head is one year ; as the period of its fall approaches, a reddish mark of separation is observed between the process of the frontal bone and the antler. This becomes more and more distinctly marked, until the connexion is entirely destroyed.

" The skin of the forehead extends over the process of the frontal bone when the antler has fallen. At the period of its regeneration, a tubercle arises from this process, and takes the form of the future antler, being still covered by a prolongation of the skin. The structure of the part at this time is soft and cartilaginous ; it is immediately invested by a true periosteum, containing large and numerous vessels, which penetrate the cartilage in every direction ; and, by the gradual deposition of ossific matter, convert it into a perfect bone.

" The vessels pass through openings in the projecting bony circle at the base of the antler : the formation of this part proceeding in the same ratio with that of the rest, these openings are contracted, and the vessels are thereby pressed, until a complete obstruction ensues. The skin and periosteum then perish, become dry, and fall off, the surface of the antler remaining uncovered. At the stated period it falls off, to be again produced, always increasing in size.

" The horns are shed in the spring and reproduced in summer."

A remarkable provision of nature, which is peculiar to deer and antelopes, has been described by some naturalists and doubted by others. Mr. White, with his usual accuracy of observation, has noticed the additional *spiracula*, which, he says, enabled the animal to breathe when drinking, and assist him when pursued.

"If some curious gentleman would procure the head of a fallow deer, and have it dissected, he would find it furnished with two spiracula, or breathing-places, besides the nostrils; probably analogous to the *puncta lachrymalia* in the human head. When deer are thirsty, they plunge their noses, like some horses, very deep under water while in the act of drinking, and continue them in that situation for a considerable time; but, to obviate any inconvenience, they can open two vents, one at the inner corner of each eye, having a communication with the nose. Here seems to be an extraordinary provision of nature worthy our attention, and which has not, that I know of, been noticed by any naturalist; for it looks as if these creatures would not be suffocated, though both their mouths and nostrils were stopped. This curious formation of the head may be of singular service to beasts of chase, by affording them free respiration; and no doubt these additional nostrils are thrown open when they are hard run. Mr. Ray observed that, at Malta, the owners slit up the nostrils of such asses as were hard worked; for they being naturally straight or small, did not admit air sufficient to serve them when they travelled or laboured in that hot climate. And we know that grooms and gentlemen of the turf think large nos-

trils necessary, and a perfection, in hunters and running-horses."

In the heads of deer and antelopes there are cavities imbedded in a bony case, varying in size in different species of these animals. The French call them *larmiers*, believing them receptacles for tears, of which the thinner part evaporating, a substance remains, called *larmes de cerf*. To this circumstance may be attributed the belief of the poets that the deer weeps. Sir Everard Home has explained the construction of these larmiers.*

We have already mentioned the smallness and peculiar hardness of the bone of the deer's foot; it is this peculiarity which renders the animal as strong as he is fleet. The support and strength of the joints of the feet of all animal bodies, according to Sir E. Home, depend less upon their own ligaments than upon the action of the muscles whose tendons pass over them. He says: "This fact was strongly impressed on my mind in the early part of my mental education, by seeing a deer which leaped over the highest fences, and the joints of whose feet, when examined, were as rigid in every other direction but that of their motion as the bone itself; but when the tendo Achillis, which passed over the joint, was divided, with a view to keep the animal from running away, the foot could readily be moved in any direction, the joint no longer having the smallest firmness."†

The stag is sometimes domesticated, and the fallow deer very often. The latter may be easily induced to live in stables; and he manifests a sort

* Comparative Anatomy, vol. iii., p. 245.
† Ibid., vol. i., p. 96.

of affection for the horse. At Newmarket, in 1828, there was a deer which was accustomed regularly to exercise with the race-horses; and the creature was delighted to gallop round the course with them in their morning training.

The arrangement of the teeth of the various species of deer and of the antelope tribes is generally as follows, though there are constant exceptions: Incisors, $\frac{0}{8}$, Canine, $\frac{0-0}{0-0}$, Molar, $\frac{6-6}{6-6}$. Total, 32.

CHAPTER XIII.

THE REINDEER.

The Reindeer. *Cervus Tarandus*, LINNÆUS.—*Cervus Rangifer*, BRISSOT.—*Renne*, BUFFON.

THE actual locality of the reindeer, determined as it is by the temperature of the polar climates, presents another of the many forcible examples of the inseparable connexion of particular animals with the wants of human society. The reindeer has been domesticated by the Laplanders from the

earliest ages; and has alone rendered the dreary region in which this portion of mankind abides at all supportable. The civilization of those extreme northern regions, which is steadily advancing, entirely depends upon the reindeer. All communication through the interior parts of Lapland is suspended in summer; and the inhabitants of Finmark travel by land only in the winter season.

The traveller from Norway or Sweden may proceed with ease and safety even beyond the polar circle; but when he enters Finmark he cannot stir without the reindeer; and with this faithful servant, the Finmark dealer may travel from his native wilds, to dispose of his produce in the markets of Torneo and Stockholm. The reindeer alone connects two extremities of a kingdom; and without him, the comforts and the knowledge of civilized life could never be extended over those coun-

Laplander in his sledge.

tries which, during a greater part of the year, are cut off from all other communication with the other portions of mankind.*

* See De Broke's Travels in Lapland, p. 75.

The inhabitants of Lapland are divided into two classes; those who live upon the shore and subsist by fishing, and those who wander through the summer and winter with no shelter but their tents, and no provision but their reindeer. In summer the wandering or mountain Laplander is compelled to undertake the most arduous journeys to the coast for the preservation of his deer. Mr. De Broke has described these migrations:*

"Whale Island, during the summer months, is never without three or four families of mountain Laplanders (Field-finner), with their herds of reindeer. The causes that induce, nay, even compel these people to undertake their long and annual migrations from the interior parts of Lapland to its coast, though they may appear singular, are sufficiently powerful. It is well known, from the accounts of those travellers who have visited Lapland during the summer months, that the interior parts of it, particularly its boundless forests, are so infested by various species of gnats and other insects, that no animal can escape their incessant persecutions. Large fires are kindled, in the smoke of which the cattle hold their heads, to escape the attack of their enemies; and even the natives themselves are compelled to smear their faces with tar, as the only certain protection against their stings. No creature, however, suffers more than the reindeer from the larger species (œstrus tarandi), as it not only torments it incessantly by its sting, but even deposites its egg in the wound it makes in its hide. The poor animal is thus tormented to such a degree, that the Laplander, if he were to remain in the for-

* Travels in Lapland, p. 31.

ests during the months of June, July, and August, would run the risk of losing the greater part of his herd, either by actual sickness, or from the deer fleeing of their own accord to mountainous situations to escape the gadfly. From these causes the Laplander is driven from the forests to the mountains that overhang the Norway and Lapland coasts. the elevated situations of which, and the cool breezes from the ocean, are unfavourable to the existence of these troublesome insects, which, though found on the coast, are in far less considerable numbers there, and do not quit the valleys; so that the deer, by ascending the highlands, can avoid them."

The wild herds of reindeer ascend the mountains in the summer to free themselves from these parasitical insects of the forest; and the tame deer often wander from their masters for the same object. These insects, particularly the *œstrus*, so terrify the herds, that the appearance of a single one will render them furious. Schreber, a celebrated natural-

Insects which attack the Reindeer.

ist, has represented these periodical tormentors of the poor reindeer. The Laplanders say that one of their objects in going to the coast is, that the deer

may drink the sea-water; and that he takes one draught, which destroys the larvæ of the fly, but never repeats it.

According to the accounts of the people of Finmark, the attacks of these fearful creatures are not the only torments of the reindeer. An insect, or, rather, worm, the *furia infernalis*, originally mentioned by Linnæus, is said to produce the most fatal effects upon the herds. Linnæus, indeed, altered his opinion late in life as to the existence even of this worm; and the Swedish naturalists now treat it as entirely fabulous. Dr. Clarke, however, supposes himself to have been wounded by this very creature during his travels in Sweden. The Laplanders themselves firmly believe in its existence; and its fatal powers, as represented by these people, are thus described by De Broke:

"In 1823, the Laplanders are stated to have suffered so greatly in their herds, that five thousand head died from the sting of this creature; and that even the wolves and other animals that preyed upon the dead carcasses caught the infection, and died with the same symptoms. A Laplander who possessed five hundred deer, on perceiving the destruction among them, thought it best to kill the whole herd; but so quickly did its ravages spread, that, before he could accomplish his purpose, they all died. Great numbers of cattle and sheep were likewise destroyed by its attack, and it fell in some degree upon the human species, a few having become victims to it. A young girl, who was shearing some sheep that had died from the attack of the *furia*, felt, while thus employed, a sudden pain in one of her fingers, which rapidly increased, and,

on examining the part, she found a small puncture like the prick of a needle; her master, who was by, had the presence of mind to cut the finger off on the spot, and it was the means of saving her life.

"The pest is stated to have been confined to Russian and Swedish Lapland, and did not spread higher than Muonioniska. Norwegian Lapland, fortunately, was not visited with this calamity; and, in order to prevent it from being introduced, all furs, during the year of its prevalence, were forbidden to be purchased."*

It is quite true that, during the summer of 1823, there was an extraordinary mortality among the reindeer of Norway and Lapland; but the better informed people attributed it, not to the *furia infernalis*, but to some unwholesome quality of the moss; and the medical men at Stockholm considered the disease with which the herds had been attacked as a particular variety of hydrophobia. The reindeer are also subject to inflammation of the brain; which probably arises from their great sensibility to heat. In the hottest weather, the thermometer rises, even at the North Cape, as high as 90° of Fahrenheit.

The movements of the wandering Laplander are determined by those of his deer. As camels constitute the chief possession of an Arab, so do the reindeer compose all the wealth of a Laplander. "The number of deer belonging to a herd is from three hundred to five hundred; with these a Laplander can do well, and live in tolerable comfort. He can make in summer a sufficient quantity of cheese for the year's consumption; and, during the

* Travels, p. 99.

winter season, can afford to kill deer enough to supply him and his family pretty constantly with venison. With two hundred deer, a man, if his family be but small, can manage to get on. If he have but one hundred, his subsistence is very precarious, and he cannot rely entirely upon them for support. Should he have but fifty, he is no longer independent, or able to keep a separate establishment, but generally joins his small herd with that of some richer Laplander, being then considered more in the light of a menial, undertaking the laborious office of attending upon and watching the herd, bringing them home to be milked, and other similar offices, in return for the subsistence afforded him."* With this stock the Laplander wanders through the greatest variety of wild and beautiful scenery; but he is little sensible to the impressions which such regions produce upon the mind of an intelligent traveller. The extremes of bodily fatigue and want leave little room for the cultivation of the mind; and the love of the sublime and beautiful of nature belongs to an advanced stage of the intellect. These rich summer scenes of Lapland are wonderfully enlivened by the presence of the wanderer and his herds. Von Buch, a celebrated traveller, has well described the evening milking-time:

"It is a new and pleasing spectacle to see in the evening the herd assembled round the gamme (encampment) to be milked. On all the hills around, everything is in an instant full of life and motion. The busy dogs are everywhere barking, and bringing the mass nearer and nearer, and the reindeer bound and run, stand still, and bound again, in an

* De Broke, p. 45.

indescribable variety of movements. When the feeding animal, frightened by the dog, raises his head, and displays aloft his large and proud antlers, what a beautiful and majestic sight! And when he courses over the ground, how fleet and light are his speed and carriage! We never hear the foot on the earth, and nothing but the incessant crackling of his knee joints, as if produced by a repetition of electric shocks, a singular noise; and from the number of reindeer, by whom it is at once produced, it is heard at a great distance. When all the herd, consisting of three or four hundred, at last reach the gamme, they stand still, or repose themselves, or frisk about in confidence, play with their antlers against each other, or in groups surround a patch of moss browsing. When the maidens run about with their milk vessels from deer to deer, the brother or servant throws a bark halter round the antlers of the animal which they point out to him, and draws it towards them; the animal generally struggles, and is unwilling to follow the halter, and the maiden laughs at and enjoys the labour it occasions, and sometimes wantonly allows it to get loose, that it may be caught again for her; while the father and mother are heard scolding them for their frolicsome behaviour, which has often the effect of scaring the whole flock. Who, viewing this scene, would not think on Laban, on Leah, Rachel, and Jacob? When the herd at last stretches itself, to the number of so many hundreds at once, round about the gamme, we imagine we are beholding an entire encampment, and the commanding mind which presides over the whole stationed in the middle."

The noise which the traveller describes as "the crackling of his knee joints," is produced by the contraction of the reindeer's hoofs when the foot is raised from the ground. These hoofs are not narrow and pointed, like those of the fallow deer, which finds its food upon unyielding surfaces; but they are broad and spreading; and thus, when the reindeer crosses the yielding snows, the foot presents a large surface, and, like the snow shoe of the Norwegians and Canadian Indians, prevents, to a certain extent, the animal sinking as deeply as it would if the hoof were small and compact.

Reindeer's foot contracted.

Reindeer's foot expanded.

The Laplander's summer lasts from about June to September. The herds and their owners depart therefore from the coasts early in that month, that they may take up their winter quarters before the fall of the snows. As the winter approaches, the coat of the reindeer begins to thicken in the most remarkable manner, and assumes that lighter colour which is the great peculiarity of polar quadrupeds. During the summer the animal pastures upon every green herbage, and browses upon the

shrubs which he finds in his march. In the winter, his sole food is the *lichen* or moss, which he instinctively discovers under the snow. It is a singular, and now well-established fact, that the reindeer will eat with avidity the lemming or mountain rat, presenting one of the few instances of a ruminating animal being in the slightest degree carnivorous. The extraordinary instinct with which the reindeer discovers the lichen is well illustrated by De Broke:

"The flatness of the country increased as we proceeded, and at times it was even difficult to tell whether we were moving on land or water, from the uniformity of the white surface around us. In this respect our deer were far better judges than ourselves, as, though there might be a depth of some feet of snow above the ice, wherever we stopped for a few minutes upon any lake, in no one instance did they attempt to commence their usual search after their food; yet, when upon land, their natural quickness of smell enabled them to ascertain, with almost unerring certainty, whether there was any moss growing beneath them or not. By the fineness of this sense of the animal the Laplanders are chiefly guided in fixing their different winter-quarters; never remaining in those parts which they know with certainty produce but little moss, from the indifference of their deer, and the few attempts made by them in removing the snow."

When the winter is fairly set in, the peculiar value of the reindeer is felt by the Laplanders. Without him, as we have already said, communication would be almost utterly suspended. Harnessed to a sledge, the reindeer will draw about 300 lbs.;

but the Laplanders generally limit the burden to 240 lbs. The trot of the reindeer is about ten miles an hour; and their powers of endurance is such, that journeys of one hundred and fifty miles in nineteen hours are not uncommon. There is a portrait of a reindeer in the palace of Drotningholm (Sweden), which is represented, upon an occasion of emergency, to have drawn an officer with important despatches the incredible distance of eight hundred English miles in forty-eight hours.* This event is stated to have happened in 1699, and the tradition adds that the deer dropped down lifeless upon his arrival. Pictet, a French astronomer, who visited the northern parts of Lapland in 1769, for the purpose of observing the transit of Venus, was anxious to know the speed of the reindeer; and therefore started three reindeer in light sledges for a certain short distance, which he accurately measured. The following was the result:

"The first deer performed 3089 feet, 8 inches, and $\frac{96}{100}$ in two minutes, being at the rate of nearly 19 English miles in an hour, and thus accomplishing 25 feet, 8 inches, and $\frac{96}{100}$ in every second.

"The second did the same in three minutes; and the third and last deer, in three minutes and twenty-six seconds. The ground in this race was nearly level."

The reindeer requires considerable training to prepare him for sledge-travelling; and he always demands an experienced driver. If the animal is not well broken-in, he is unmanageable; and if the driver is inexpert, the deer has sagacity enough to turn round and rid himself of him by the most furious assaults. Mr. de Broke several times felt the

* De Broke's Winter in Lapland.

inconvenience of ill-trained deer in his winter journey across Lapland.

"The deer we had procured were as unmanageable and unruly as deer could well be, being none of them well broken-in; and our first set off was by no means a pleasant one, as, after tumbling with the quickness of lightning down the steep bank of the river, the deer proceeded at full gallop across a very rough and broken country, with steep and slippery descents. It was quite impossible, from the nature of the ground, to prevent being frequently rolled over in the pulk (sledge); and, when this was the case, the strength and freshness of the deer, and the good order of the snow, which was very hard, made them regard very little the additional weight caused by the prostrate position of the sledge; so that they continued to follow, at full speed, the rest of the deer, leaving the unfortunate wight at their heels to find his balance as well as he could.* Notwithstanding that which had been harnessed to my pulk was by no means a lamb in quiteness, I had good reason to congratulate myself upon having escaped the animal which one of the party had to his share, and which was a deer of the wild breed, that had been caught when young by the Laplanders. In size it was larger than the others, thinner, with more appearance of bone, and considerably stronger. With respect to any command over it, this was quite out of the question; and it dragged pulk and driver along with the greatest ease wherever it pleased."

And yet these instances of resistance to their drivers are only exceptions to the general character

* The person drawn is strapped to the pulk.

of the reindeer. He is ordinarily so docile that he scarcely needs any direction, and so persevering that he toils on, hour after hour, without any refreshment except a mouthful of snow, which he hastily snatches. "We again resumed our course, the deer appearing no way fatigued, and proceeding so steadily and quietly that the act of driving them was merely holding the rein, which at last became so tedious that some of the party behind lashed their deer to the sledge before, the whole keeping up a long steady trot. This is the usual travelling pace of the reindeer when performing long journeys; for though, occasionally, the animal may proceed at a gallop for some miles on first starting, or in those situations where the snow is very good, it is natural to suppose it will gradually relax its pace. The speed of the party, however, is entirely dependant upon the foremost deer, by which the motions of those behind are almost entirely regulated; and I observed that, when we first set off in the morning, the instant it had its head at liberty, it almost invariably commenced a full gallop, the rest all following at a similar pace, as if moved by one common impulse. This was kept up by them as long as they remained unexhausted, the driver having little power to stop the animal, from the rein being merely attached in the manner it is to the head. The eagerness of the deer to set off is frequently followed by ludicrous scenes, the driver being often placed in an awkward situation if he be inattentive, and do not happen to have the rein in his hand at the moment."*

The obstinacy which the reindeer sometimes dis-

* De Broke, p. 508.

plays is the preservation of his driver. The great difficulty is to separate him from his companions, or to prevent him joining the herds which he sees upon his track. When travelling, if the distance between the foremost and hindmost deer be great, and the guide make a turn to the right or left, instead of cutting across to save distance, the whole of the deer in the rear continue on to the spot where the turn was made. This gregarious disposition is given him for his protection against the danger of a solitary state, and the Laplander avails himself of it when he loses his road, or is separated from those with whom he travels.

The mode of hunting the wild reindeer by the Laplanders, the Esquimaux, and the Indians of North America, have been accurately described by various travellers. We select the following accounts from the interesting narratives of Captain Lyon and Captain Franklin. Captain Lyon says:

"The reindeer visits the polar regions at the latter end of May or the early part of June, and remains until late in September. On his first arrival he is thin, and his flesh is tasteless; but the short summer is sufficient to fatten him two or three inches on the haunches. When feeding on the level ground, an Esquimaux makes no attempt to approach him; but, should a few rocks be near, the wary hunter feels secure of his prey. Behind one of these he cautiously creeps, and, having laid himself very close, he, with his bow and arrow before him, imitates the bellow of the deer when calling to each other. Sometimes, for more complete deception, the hunter wears his deerskin coat and hood so drawn over his head as to resemble, in a

great measure, the unsuspecting animals he is enticing. Though the bellow proves a considerable attraction, yet, if a man has great patience, he may do without it, and may be equally certain that his prey will ultimately come to examine him; the reindeer being an inquisitive animal, and, at the same time, so silly, that, if he sees any suspicious object which is not actually chasing him, he will gradually, and after many caperings, and forming repeated circles, approach nearer and nearer to it. The Esquimaux rarely shoot until the creature is within twelve paces, and I have frequently been told of their being killed at a much shorter distance. It is to be observed, that the hunters never appear openly, but employ stratagem for their purpose, thus, by patience and ingenuity, rendering their rudely-formed bows and still worse arrows as effective as the rifles of Europeans. When two men hunt in company, they sometimes purposely show themselves to the deer; and when his attention is fully engaged, walk slowly away from him, one before the other. The deer follows; and, when the hunters arrive near a stone, the foremost drops behind it and prepares his bow, while his companion continues walking steadily forward. This latter the deer still follows unsuspectingly, and thus passes near the concealed man, who takes a deliberate aim and kills the animal. When the deer assemble in herds, there are particular passes which they invariably take, and, on being driven to them, are killed by arrows by the men, while the women with shouts drive them to the water. Here they swim with the ease and activity of water-dogs, the people in kayaks chasing and easily spearing them;

the carcasses float, and the hunter then presses forward and kills as many as he finds in his track. No springs or traps are used in the capture of these animals, as is practised to the southward, in consequence of the total absence of standing wood."*

Captain Franklin describes the mode in which the Dog-rib Indians kill the reindeer, which he had from Mr. Wentzel, who resided long among that people:

"The hunters go in pairs, the foremost man carrying in one hand the horns and part of the skin of the head of a deer, and in the other a small bundle of twigs, against which he from time to time rubs the horns, imitating the gestures peculiar to the animal. His comrade follows, treading exactly in his footsteps, and holding the guns of both in a horizontal position, so that the muzzles project under the arms of him who carries the head. Both hunters have a fillet of white skin round their foreheads, and the foremost has a strip of the same round his wrists. They approach the herd by degrees, raising their legs very slowly, but setting them down somewhat suddenly after the manner of a deer, and always taking care to lift their right or left feet simultaneously. If any of the herd leave off feeding to gaze upon this extraordinary phenomenon, it instantly stops, and the head begins to play its part by licking its shoulders, and performing other necessary movements. In this way the hunters attain the very centre of the herd without exciting suspicion, and have leisure to single out the fattest. The hindmost man then pushes forward his comrade's gun, the head is dropped, and they both fire

* Private Journal.

nearly at the same instant. The deer scamper off, the hunters trot after them; in a short time the poor animals halt, to ascertain the cause of their terror; their foes stop at the same moment, and, having loaded as they ran, greet the gazers with a second fatal discharge. The consternation of the deer increases; they run to and fro in the utmost confusion; and sometimes a great part of the herd is destroyed within the space of a few hundred yards."

In a country which affords such an uncertain supply of food, and whose climate is so severe through a great part of the year as Lapland, the progress of civilization can never be very considerable. The people must, of necessity, lead a wandering life, uniting the hunting and the pastoral character; but incapable, from physical causes, of pursuing the arts of agriculture, or entering largely into the communications of commerce. But what civilization exists or may exist among them, is wholly to be ascribed to their best possession, the reindeer. It is not, therefore, incompatible with the great arrangements by which the universe has been created and is supported, to believe that the reindeer has been specially bestowed upon the inhabitants of the polar regions as an improvement of their necessary lot, in the same way that the locality of the camel has been fixed in the sandy and stony deserts of Asia and Africa. The poor Laplander knows the value of the faithful creature which affords him food, clothing, and the means of transport; and he offers his homage of thanksgiving to the Great Author of nature, who has given him

this companion of his wanderings. Whether the native of the polar regions hunt the wild deer amid the icy mountains, be hurried by his aid across the frozen wastes, or wander with his family and his herds till the long winter begins, almost without any gradation, to succeed the short summer, the lives of the Laplander and of the reindeer are inseparably united.

Lapland Family returning from the Coast.

THE END.

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